

APPROVED

Director General



D.V. Kovalenko

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QUALITY MANAGEMENT SYSTEM

M-06-04


OPERATION MANUAL
GROUND HANDLING OPERATIONS MANUAL (PART E) –
ORGANIZATION OF AIRCRAFT GROUND HANDLING

Version 02

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	Terms, Definitions, Abbreviations and Designations			

1 TERMS, DEFINITIONS, ABBREVIATIONS AND DESIGNATIONS

For the purposes of this Manual, the used terms and definitions correspond to those given in the Air Code of the Russian Federation as well as in the:

- standards and recommended practices of the International Civil Aviation Organization;
- standards and recommended practices of the International Air Transport Association;
- as well as others listed below:


Operator / Loadmaster – The Airline representative who controls the loading operations on board the aircraft

Cargo damage – Damage to cargo, its packaging, unit load device (ULD)


Damaged cargo unsuitable for further carriage – Damaged cargo posing a hazard to the aircraft, crew, passengers, other cargo, servicing personnel

Abbreviations and designations used in this Manual:


TUP	–	Aviation Company “Aviastar-TU” Limited Liability Company
AHM	–	Airport Handling Manual (IATA Airport Handling Manual)
AMM	–	Aircraft Maintenance Manual (operational and technical documentation)
ATA	–	Time of Arrival (actual time of the aircraft arrival)
ATD	–	Actual Time of Departure (actual time of the aircraft departure)
AVI	–	Live Animals
AWB	–	Air Waybill
BULK	–	Bulk cargo
CPM	–	A message on load (ULD) distribution in aircraft according to AHM
CS	–	Operation Centre Customer Service
DG	–	Dangerous Goods
DGR	–	IATA Dangerous Goods Regulations
ETA	–	Estimated Time of Arrival (estimated time of the aircraft arrival)
FBL	–	Freight Booked List according to IATA Cargo IMP
FFM	–	Airline Flight Manifest according to IATA Cargo IMP
FHL	–	House Air Waybill information according to IATA Cargo IMP
FSU	–	Freight Status Update Message according to IATA Cargo IMP
FWB	–	Air Waybill Data according to IATA Cargo IMP
GHA	–	Ground Handling Agent
GHOM	–	Ground Handling Operations Manual
GPU	–	Ground Power Unit
GSE	–	Ground Support Equipment (ground aircraft servicing and ramp equipment/vehicles)
IATA	–	International Air Transport Association.

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IMP	–	Interchange Message Procedures
LAR	–	IATA Live Animals Regulations
LIR	–	Loading Instruction
MCT	–	Minimum Connecting Time. Minimum connecting time for transfer cargo. Connecting time for transfer cargo is defined as the time interval between the time of arrival of any aircraft with transfer cargo and the time of departure of the connecting aircraft with such transfer cargo at this airport
MGT	–	Minimum Ground Time (minimum time of one aircraft servicing on the ramp)
OPS	–	Operations (Ground Handling Department employee)
PCR	–	IATA Perishable Cargo Regulations
PER	–	Perishable cargo
PSI	–	Pound (per) square inch (the pressure measuring unit is pound per square inch)
PRE	–	Pre-Notification of Special Cargo
RFS	–	Road Feeder Service. Herewith, any such cargo movement is assigned the flight number which is registered in the Cargo Spot
SCM	–	Message on availability of ULDs at a certain airport as per results of the inventory according to AHM
SLA	–	Service Level Agreement
SSS	–	Shipment with shock and tilt sensors applied
STD	–	Scheduled Time of Departure (scheduled time of the aircraft departure)
UCM	–	ULD Control Message according to AHM
ULD	–	Unit Load Device
UWS	–	ULD/BULK WEIGHT Signal – AHM message
AL	–	Airline
SS	–	Summer Season
RW	–	Runway
AC	–	Aircraft
APU	–	Auxiliary Power Unit
CCA	–	Customs Control Area
EMD	–	Engineering and Maintenance Department
PS	–	Parking Stand
WS	–	Winter Season
HC	–	Handling Company
GHD	–	Ground Handling Department
FPD	–	Flight Planning Department
MLG	–	Main Landing Gear
ACD	–	Aircraft Damage
OCD	–	Operation Control Department

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DET	–	De-Icing Treatment
NLG	–	Nose Landing Gear
ASS	–	Aviation Security Service
TSW	–	Temporary Storage Warehouse
ACS	–	Air Conditioning System
ICS	–	InterCom System
TMD	–	Transportation Management Department
FT	–	Fuel Truck
ASU	–	Air Start Unit
OCC	–	Operation Control Center
EPR	–	External Power Receptacle

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	Regulatory References			


2 REGULATORY REFERENCES

The following are regulatory documents used in the development of this Procedure and/or referred to in the text of the Procedure:

- IATA Airport Handling Manual (AHM);
- IATA Ground Operations Manual (IGOM, Chapter 4);
- Maintenance Control Manual by type of aircraft;
- Boeing (aircraft manufacturer) Weight and Balance Manual;
- Civil Aircraft Weight and Balance Manual;
- IATA Dangerous Goods Regulations;
- ICAO Technical Instructions for the Safe Transport of Dangerous Goods by Air;
- Flight Operations Manual (FOM) of Aviacompany “Aviastar-TU” LLC.

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3 GENERAL INFORMATION

3.1 General Information


- 3.1.1 This GHOM Part defines the standards, order and sequence of procedures and operations when preparing, arranging and carrying out ground handling of Aviastar-TU aircraft by Handling Companies (HC) personnel for their safe and effective implementation. This Part standards reflect the requirements of regulations and standards defined by the IATA AHM (IGOM). The minimum safety and precaution requirements defined in this section must be applied and understood by all ramp personnel whilst implementing any ground handling procedures.
- 3.1.2 Among other things, the purpose of this document is to clarify the rules and procedures for aircraft ground handling in order to prevent the threat of death and injury to crew members and servicing personnel, as well as any accidents.

3.2 Scope of the Part


- 3.2.1 This Part shall be applied by all personnel of Aviastar-TU LLC (the Airline) and Handling Companies (HC) involved in implementation and provision of the Airline aircraft ground handling procedures. This Part contains a basic set of standard procedures for the safe performance of aircraft ground handling.

3.3 Aircraft Ground Handling Objectives

- 3.3.1 The main objectives in the implementation of ground handling procedures for the Airline aircraft shall include:
- marshalling the aircraft when clearing the runway and taxiing onto the ramp after landing;
 - preparation of the ramp and ground support equipment for aircraft ground handling;
 - meeting the aircraft at the ramp;
 - aircraft handling which includes:
 - installation of wheel chocks;
 - provision of ground power unit for the aircraft;
 - aircraft external inspection;
 - positioning of ground support equipment to the aircraft;
 - provision of air conditioning / heating units for the aircraft;
 - unloading (loading) of cargo and mail;
 - unloading (loading) of catering supplies;
 - cleaning of the cockpit, cargo cabin and baggage compartments;
 - potable water servicing;
 - lavatory servicing;
 - fueling (refueling, defueling);
 - preparation for engine start and aircraft taxiing including:
 - aircraft external inspection;
 - removal of wheel chocks;
 - control during engine start-up (including the connection/disconnection of the ASU and control of the ASU receptacle doors closure);
 - towing and marshalling to the start-up point;
 - aircraft de-icing;

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- aircraft marshalling on taxiing for take-off before occupying the runway.

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4 AIRCRAFT GROUND HANDLING

4.1 General safety precautions for ramp operations

Ensuring safe performance of aircraft ramp ground handling procedures and operations is achieved through the compliance with safety and precautionary measures by all personnel involved in ground handling operations.

ATTENTION!

If you see or suspect that any ground handling operation/action may cause damage to the aircraft, it is necessary to immediately report this to the person in charge of ground handling (ground handling supervisor).

4.1.1 Danger areas

- 4.1.1.1 Danger areas are areas with a certain risk of injury or damage from being caught in the exhaust jet from a running aircraft jet engine or the possibility of being sucked into the engine inlet.
- 4.1.1.2 The risk of damage or injury is especially high when the aircraft is stopped with a subsequent increase in thrust to continue its movement.
- 4.1.1.3 All vehicles and personnel should be out of danger areas when the aircraft engines are running and/or when a flashing beacon is on.
- 4.1.1.4 In order to prevent any incidents and accidents caused by aircraft engines, it is **FORBIDDEN** for personnel, ground support equipment and vehicles to be present in the following danger areas during the aircraft arrival and departure:
 - engine inlet areas;
 - engine exhaust areas.
- 4.1.1.5 The dimensions of danger areas depend on the engine operation mode.
- 4.1.1.6 Figures 1 and 2 show aircraft danger areas.

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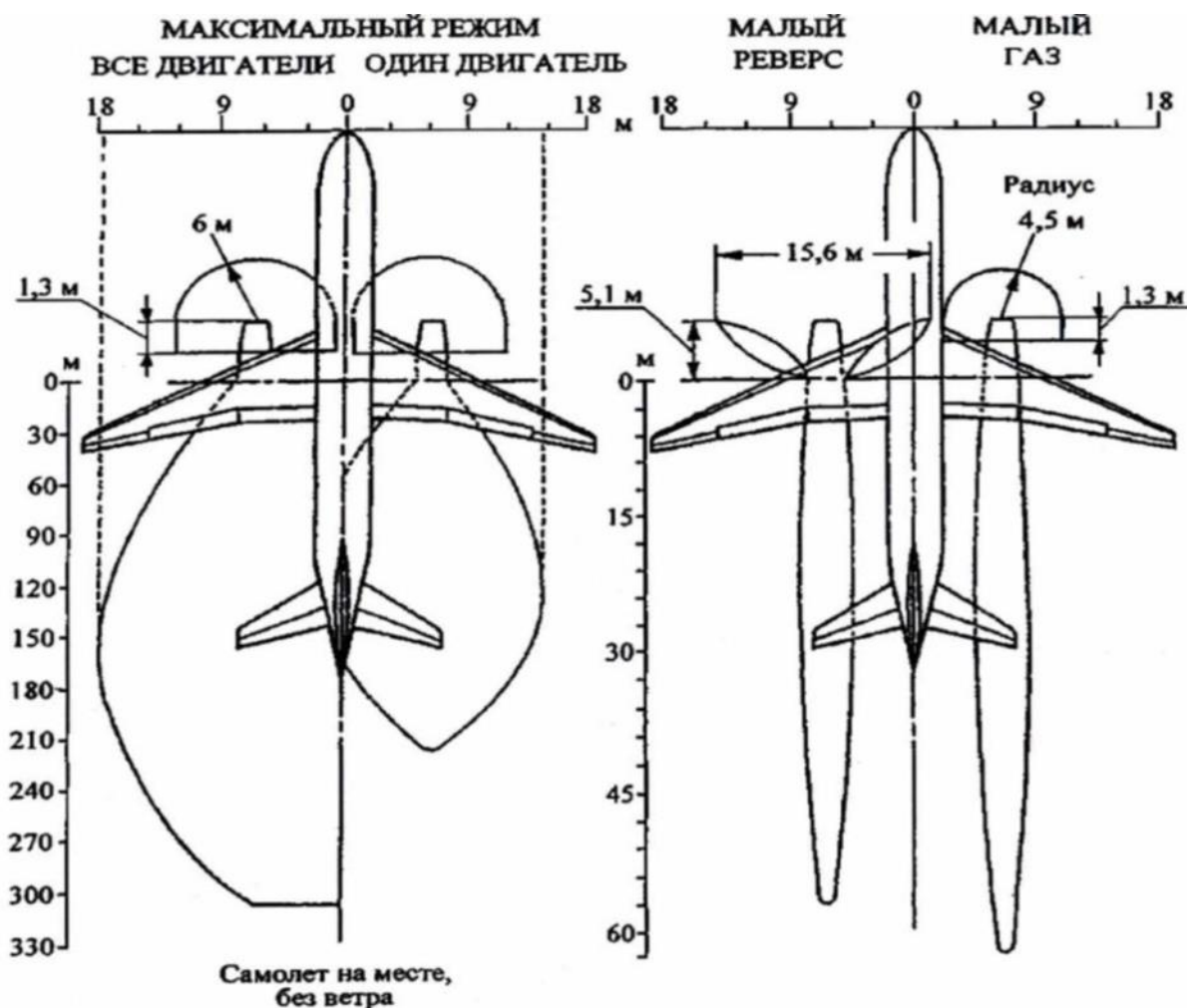


Figure 01. TU-204C / TU-204-100C aircraft danger areas



Figure 02. Boeing 757 200F danger areas

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4.1.2 Ground support equipment restriction area and ground support equipment stop line

The ground support equipment restriction area (Figure 3) is defined as the ramp area bordered by a red line called the ground support equipment safety stop line or indicating the boundaries of aircraft on the ramp during ground handling operations. The ground support equipment restriction area must be clear of equipment and foreign object debris before and during any aircraft taxiing in and out.

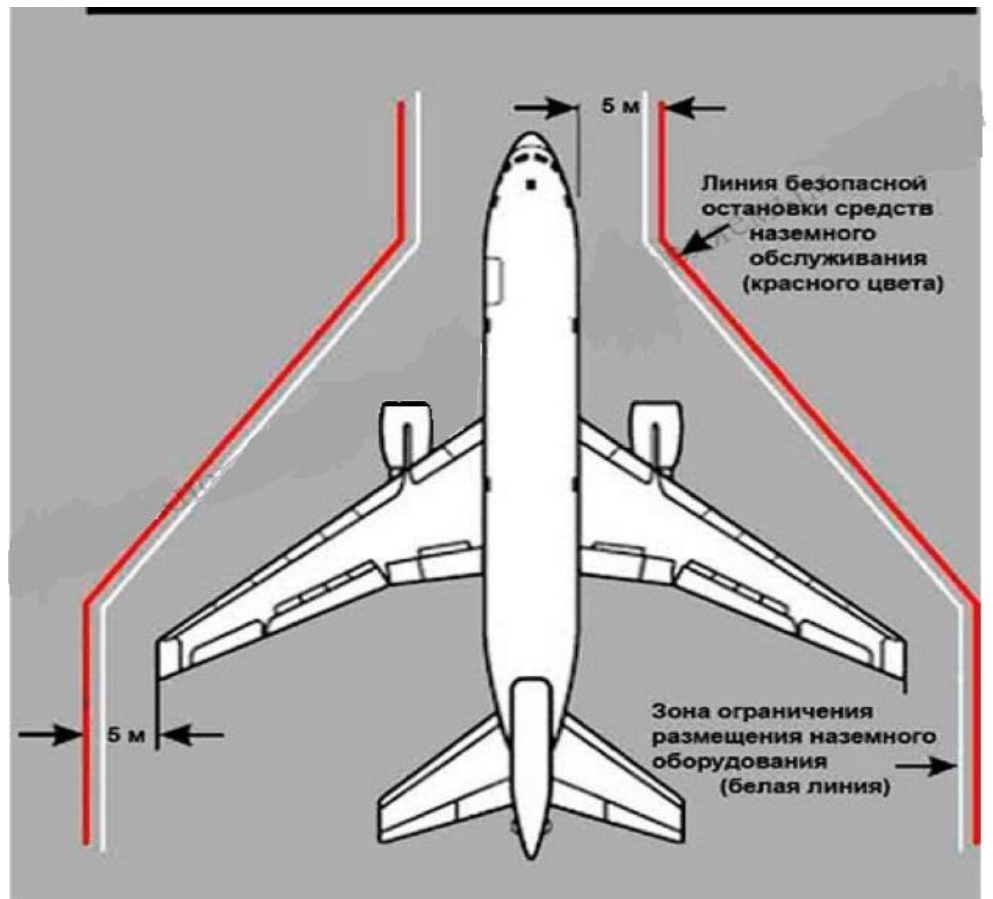



Figure 03. Ground Support Equipment Restriction Area

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4.1.3 Foreign Object Debris

- 4.1.3.1 Foreign Object Debris (FOD) is a general term for forgotten or lost items applicable to any item posing a threat to the safety and integrity of aircraft.
- 4.1.3.2 It is the responsibility of any person involved in the ground handling process to mitigate the risk of damage to aircraft by FOD. All FOD must be removed to the specially designated ramp areas and disposed of as soon as found.
- 4.1.3.3 Often the presence of FOD is due to negligence of the personnel performing duties in the controlled area and their lack of understanding of the possible consequences of FOD presence or entry in/into the controlled area due to high winds.
- 4.1.3.4 Samples of FOD:
- plastic and paper bags/cups, rags;
 - metal objects: nuts and bolts, empty oil and hydraulic fluid cans, tools and equipment;
 - natural objects: stones, pebbles, branches, tree parts;
 - other litter: torn bags, handles, baggage wheels, etc.

ATTENTION!

FOD can enter the engine and cause its damage. FOD can cause damage to the pneumatic wheels, control system, etc. Any such damage can bring to an aircraft emergency condition in flight.

- 4.1.3.5 The personnel responsible for meeting the aircraft before its arrival on the ramp and commencement of ground handling operations shall carry out the following checks:
- check of the ramp and parking stand;
 - check of the ground support equipment positioning and parking area in the immediate vicinity of the aircraft handling area;
 - check of the ground support equipment and vehicles (including their unlocked cabins);
 - check of the disposal sites and/or trash containers for their cleanliness and secure closure;
 - check of the containers transported on vehicles (the containers shall be securely closed).
- 4.1.3.6 If any FOD is found in these areas, it must be removed and disposed of.

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4.2 Safety instructions for the operation of Ground Support Equipment (GSE)

4.2.1 General safety instructions for the ground support equipment

- 4.2.1.1 Only the duly qualified and authorized personnel with the appropriate training is allowed to operate the ground support equipment.
- 4.2.1.2 The following general safety requirements must be complied with when using the ground support equipment:
- before entering the aircraft handling area, it is necessary to perform at least one braking cycle to a full stop on the ramp surface to check the GSE braking system (this must be done before the ground support equipment stop line or at least 15 ft (5 m) from the aircraft);
 - when positioning the GSE to or removing the GSE from the aircraft, the speed of such GSE must not exceed the speed of a walking person;
 - any maneuvers of the moving equipment must consider the prevention of damage to people or aircraft;
 - when moving backwards, it is necessary to use additional personnel video system or rear-view mirrors to control such movement safety;
 - it is forbidden to move on the equipment under the wing or fuselage.

4.2.2 General requirements for operation and positioning of Ground Support Equipment (GSE) for the Handling Company (HC).

- 4.2.2.1 The used GSE must be serviceable and comply with the requirements for safe operation.
- 4.2.2.2 At the beginning of the work shift, it is necessary to check all GSE involved in the aircraft ground handling, including brakes, rubber protective bumpers, safety systems, etc.
- 4.2.2.3 The GSE external inspection (walk-around) shall be performed prior to its operation.
- 4.2.2.4 All power-driven vehicles and ground handling facilities must be equipped with the fire extinguishing equipment.
- 4.2.2.5 The approach (departure) of special-purpose vehicles and self-propelled devices to the aircraft should be carried out in accordance with the scheme of approach (departure).
- 4.2.2.6 When positioning the equipment near the aircraft or outside the aircraft handling area, it is necessary to:
- set the equipment, if provided for by its design, to the parking brake, with the transmission switch in the parking or neutral position;
 - install the wheel chocks.
- 4.2.2.7 After positioning the GSE at the servicing points, the cargo on dollies must be evenly distributed to ensure stability (heavy cargo to be placed at the bottom and in the middle).
- 4.2.2.8 The movement of a dolly train must consider the reduction of the steering radius and corner cutting when turning, to avoid injury to personnel, as well as damage to aircraft and other equipment.
- 4.2.2.9 When positioning the GSE, special attention must be paid to the distance between the vehicle and aircraft as well as other equipment and fixtures.
- 4.2.2.10 After positioning the GSE in the aircraft handling area, it is necessary to ensure the:
- sufficient distance between the GSE and the aircraft to allow vertical movement along the aircraft fuselage and implementation of ground handling procedures in a manner that prevents the equipment from coming into contact with the aircraft;

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- installation of special equipment on stabilizers ensuring its fixation from turning and falling;
- raising of all guardrails on conveyor belts, loaders and other devices.

4.2.2.11 It is forbidden for all personnel involved in aircraft ground handling:

- to allow unauthorized persons to enter the moving GSE cabin;
- to use any portable electronic devices when operating a vehicle and when using the equipment;
- to jump from a vehicle while it is in motion;
- to leave the vehicle unattended with the engine running;
- to move vehicles with the lifting/loading devices raised except for their final approach to the aircraft.

ATTENTION!

Do not move any GSE, including passenger stairs, towards the aircraft until the following conditions are met:

- the aircraft has stopped as per the designated markup;
- the engines are off and have stopped rotating;
- the aircraft flashing beacon is off;
- the chocks are installed under the LG wheels;
- the ground personnel have established communication with the flight crew and received their permission to commence ground handling.

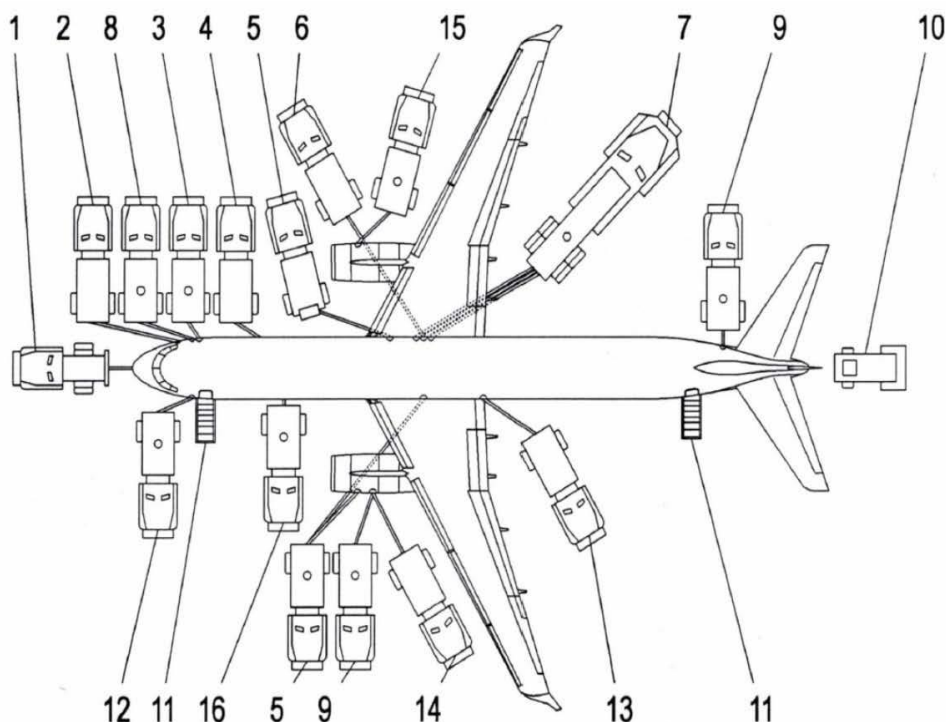
4.2.3 Non-motorized GSE

4.2.3.1 The following additional requirements must be met for all non-motorized GSE to ensure its safe operation:

- all non-motorized GSE must be braked with the brake system (if provided for by its design) and the chocks whilst such GSE is not connected to the motorized equipment;
- containers must be secured on dollies (trailers or platforms) with the appropriate restraints;
- pallets and containers must be towed closed, with the container platform necessarily locked and be unlocked for rotation only when positioned at the loading platform.

4.2.4 GSE positioning scheme

4.2.4.1 The GSE positioning scheme for TU-204C/TU-204-100C aircraft is shown in Figure 4.



- | | |
|---|--|
| 1 Тягач-буксировщик для буксировки самолета | 9 Заправщик спецжидкостями для заправки маслобаков двигателя и ВСУ маслом |
| 2 Автомобильная кислородно-зарядная станция для зарядки кислородных баллонов | 10 Самоходная площадка обслуживания для обслуживания высоко расположенных частей самолета |
| 3 Аэродромный передвижной электроагрегат для питания бортовой сети самолета переменным и постоянным током | 11 Самоходный трап |
| 4 Машина моечная | 12 Машина для обслуживания санузла для слива отходов, промывки сборного бака |
| 5 Установка питания гидросистемы для заправки и проверки гидросистем самолета | 13 Аэродромный кондиционер для подачи в самолет охлажденного или подогретого воздуха |
| 6 Воздухозаправщик для зарядки азотных емкостей агрегатов самолета | 14 Моторный подогреватель для подогрева двигателей при низких температурах окружающего воздуха |
| 7 Топливозаправщик для заправки самолета топливом | 15 Установка воздушного запуска для запуска двигателя от наземного источника |
| 8 Машина водозаправочная для заправки систем снабжения питьевой водой | 16 Самоходный погрузчик |

Figure 04. GSE positioning scheme for TU-204C/TU-204-100C aircraft

- | | |
|---------------------------|----------------------|
| 1. Tow vehicle or tractor | 9. Oil |
| 2. Oxygen | 10. High lift |
| 3. GPU | 11. Stairs |
| 4. Cleaning truck | 12. Lavatory truck |
| 5. Hydraulic | 13. Air conditioning |
| 6. Nitrogen | 14. Air heater |
| 7. Fuel truck | 15. ASU |
| 8. Potable water truck | 16. Loader |

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4.2.4.2 GSE positioning scheme for Boeing 757 200F aircraft is shown in Figure 5.

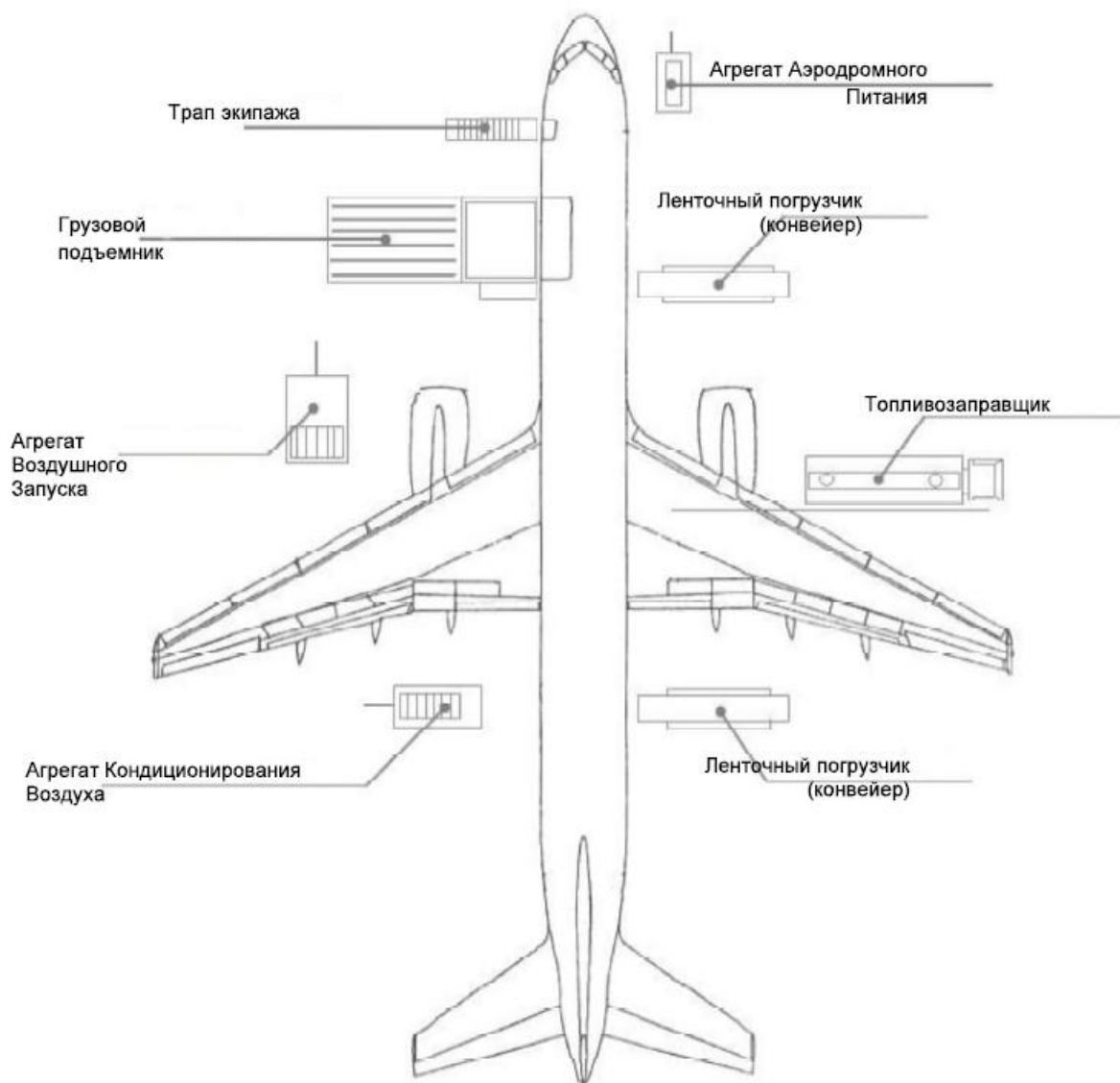


Figure 05. GSE positioning scheme for Boeing 757 200F aircraft

(top-down)

Crew stairs

Loader

Air Start Unit

Air Conditioning Unit

Ground Power Unit

Conveyor belt

Fuel truck

Conveyor belt


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Table 1

GSE necessary for handling of Boeing 757 200F aircraft

GSE	Type	Quantity
Loader	Main deck (for example, FMC Commander 30)	1
Ground Power Unit	Diesel - electric or stationary	1
Crew Stairs	Platform height 382 cm - 392 cm	1
Conveyor Belt	Standard (30 ft. recommended)	2
Tow Vehicle or Tractor	Diesel or electric	3
Cargo Dolly	125"/88" and 125"/96"	Up to 15
Container / Dolly	As necessary	Acc. to load

4.2.5 Self-propelled passenger stairs

- 4.2.5.1 Each self-propelled passenger stairs operator must be properly trained and authorized to operate the stairs.
- 4.2.5.2 Before using the stairs, it is necessary to make sure that the passage area is ready for safe utilization (no water, snow, ice, etc.).
- 4.2.5.3 Before moving to the aircraft, the passenger stairs must be in the fully retracted parking position outside the aircraft handling area. Before moving the stairs to the aircraft, it is necessary to make sure that the route is free and clear. The stairs should be moved slowly towards the aircraft until the bumpers come into contact with the aircraft or until the stairs are stopped by the approach system sensors. The passenger stairs protective rubber bumpers must not press against the aircraft fuselage - this will prevent damage to the fuselage and allow relative movement of the aircraft during its handling.


Note. If any non-motorized (non-self-propelled) stairs are to be positioned, they must be disconnected from the tow vehicle and brought to the aircraft manually. In doing so all the above safety requirements must be observed.

- 4.2.5.4 The level of the stairs top platform shall be adjusted below the bottom edge of the aircraft door. The safety system must be activated to maintain the proper level of the stairs top platform. In the absence of such safety system (automatic adjustment of the stairs top platform height), the adjustment shall be controlled and carried out by the stairs operator.

ATTENTION!

When refueling, loading and unloading the aircraft and changing its balance, the door sill height may change and there is a risk that the open door could be damaged by the stairs

- 4.2.5.5 After positioning the stairs, they are set on the outriggers. Side sliding barriers/guardrails are set in the fully released position only if the door is open.
- 4.2.5.6 It is necessary to make sure that the stairs allow for free exit from the aircraft in case of any emergency.
- 4.2.5.7 Before removing the stairs, the aircraft door shall be closed, or a safety device (strap) shall be installed in the door opening. It is necessary to make sure that there are no personnel on the stairs before the outriggers are removed.

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4.3 Aircraft loading equipment

ALL HC personnel operating the aircraft loading equipment must be trained and authorized to operate such equipment. The condition of the equipment must be checked prior to its use. Before the aircraft arrival, all loading equipment must be in its fully retracted parking position outside the aircraft handling area. Before moving such equipment to the aircraft, it is necessary to make sure that the route is free and clear.

4.3.1 HC Conveyor belt

4.3.1.1 The following safety precautions must be observed when operating the conveyor belt:

- the outermost point of the conveyor belt boom after its positioning at the aircraft should be outside the aircraft baggage compartment area;
- the conveyor belt should be moved to/from the aircraft straight to the baggage compartment door, at an angle of 90 degrees to the aircraft fuselage. When turning the boom, it is necessary to make sure of the absence of obstacles;
- safety bumpers should not touch the aircraft and the distance between the bumpers and the fuselage should not be less than 1 in (2.5 cm);
- guardrails should be installed immediately after positioning the conveyor belt at the aircraft, and they must not touch the aircraft;
- only specially authorized personnel should work inside the baggage compartment;
- it is necessary to make sure that the conveyor belt working platforms are clean and in the lowered position before it enters the aircraft handling area;
- the route of the conveyor belt should not pass under the aircraft wing;
- the conveyor belt movement toward the aircraft should be slow, especially in the vicinity of the cargo compartment door opening;
- in case of limited visibility, it is necessary to use additional personnel who will control the distance of the conveyor belt approach to the aircraft when positioning the conveyor belt to the aircraft;
- when being positioned, the conveyor belt should not come into contact with the aircraft and the distance between it and the fuselage should not be less than 2 in/5 cm or until triggering the proximity system sensors (if such equipment is installed);
- it is forbidden to close/open the baggage compartment doors while on the conveyor belt platform, it is necessary to use a stepladder therefor;
- after positioning the conveyor belt, it is necessary to switch on the safety system for automatic levelling of the conveyor belt, engage the stabilizers and set in operating position the guardrails provided for by the conveyor belt design. If there is no safety system, the operator must constantly monitor and adjust the level of the conveyor belt platform, considering the aircraft parts in its immediate vicinity.

4.3.2 Personal safety when working on aircraft and ground support equipment


4.3.2.1 All personnel whose duties require them to be on the airside must wear upper uniform in high visibility colors containing the reflective material.

4.3.2.2 Uniforms must be appropriate to the weather conditions and accessible to the personnel.

4.3.2.3 Approved hearing protectors (earplugs, headphones) must be used to protect hearing.

4.3.2.4 Depending on the type of work performed:

- safety glasses or face shields must be worn by the personnel;
- special footwear must be worn by the personnel to protect them from foot injuries;
- gloves must be worn by the personnel to protect their hands;
- the personnel are not allowed to wear jewelry such as rings or bracelets;

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- the personnel are not allowed to wear ties unless they are easily removable (on a clip);
- the personnel must stay away from the engine air intakes and outlets even after the operation of the engines has been reduced. The personnel are allowed to approach the aircraft only after the flashing lights have been switched off and a visual signal has been given by the ground handling supervisor;
- after the flashing lights on a departing aircraft have been switched on, the personnel must stay away from the engine air intakes and nozzles. If no work is to be performed, the personnel must immediately clear the aircraft parking area;
- it is necessary to be extremely careful when entering and exiting the aircraft cabins and baggage compartments;
- the personnel should be at a distance from the corridor of entry and departure of the ground support equipment, when moving a trailer with the container dollies;
- the equipment operators must make sure that no personnel are trapped by moving loads/pallets/containers into the aircraft and on the loading equipment.

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The personnel are forbidden to:

- move on the equipment, except in cases where a special place is provided for this purpose;
- try to jump from or into a moving vehicle;
- go up and down on the rear platform of any loader;
- ride on the lifting platforms when the vehicle is in motion;
- walk or stand on a moving conveyor belt;
- walk between the ULDs while they are being transported on a vehicle or trailed dolly.

4.4 Ground handling in adverse weather conditions

Weather hazards are a constant threat for ground handling operations. Ground handling operations are a high-risk area because most of them are carried out on the site exposed to external effects.


4.4.1 Working in winter conditions or on a slippery ramp

4.4.1.1 When working in winter conditions or on a slippery ramp, it is necessary to comply with some additional requirements to reduce the risk of any accidents:

- increase the time required for ground handling in case of a slippery ramp;
- take into account the increased braking distance of the ground handling equipment;
- the speed of vehicles should be reduced in case of a slippery ramp based on its actual condition;
- the operators of water and lavatory system servicing vehicles should not allow fluids to leak from the vehicles or overfill their tanks.

4.4.2 In strong winds, it is necessary to make sure that:

- stepladders and tow bars are placed outside any open areas closer to the buildings;
- the parking brakes of all ground support equipment are engaged;
- empty ULDs are secured and their doors/curtains are closed. If this is not possible, it is necessary to remove them from the aircraft handling area;
- empty containers for foreign object debris are removed from the aircraft handling area or secured;
- chocks are installed under the landing gear wheels;

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- the cargo door and baggage compartment doors are closed;
- all ground support equipment is removed from the aircraft handling area and secured.

4.4.3 Ground handling in thunderstorm conditions

4.4.3.1 When working in thunderstorm conditions, safety measures applicable to each specific airport must be considered, but at the same time the minimum safety measures listed below must be observed:

- It is forbidden to use aircraft headsets for communication with the cockpit during a thunderstorm or lightning activity or if warned of their possible occurrence. In this case, standard signals should be used;
- It is forbidden to stay in any open areas, under a telescopic bridge or near any poles at the time of lightning activity;
- Any ground handling activity is prohibited during lightning activity;
- Any aircraft refueling **must be stopped** during a thunderstorm.

Aviation Fuel Supply

4.4.4 Refueling of aircraft is carried out on the basis of contracts or letters of guarantee with fuel providers and/or airports.

4.4.5 Refueling of TU-204C, TU-204-100C aircraft with PS-90A engines and TA-12-60 APU and Boeing 757 200F aircraft is carried out in accordance with the flight report by means of a centralized fuel system or a fuel truck.

4.4.6 The maximum fuel pressure at refueling shall be 3.7 kg/cm², and operating pressure shall be 2.5 kg/cm²

4.4.7 Types of fuel used for aircraft refueling:

4.4.8 TS-1 (all-Union State Standard (GOST) 10227-86), RT (GOST 10227-86) and their mixtures in any ratio. Also, foreign Jet-A1 and Jet-A types.

4.4.9 Fuel system icing inhibitors ("I" or "IM" type) are not required.

4.4.10 It is allowed to use fuels with fuel system icing inhibitors ("I" or "IM" type) not exceeding 0.15 percent by volume.

4.4.11 Aircraft refueling is carried out subject to the quality certificate.

4.4.12 Refueling with fuels and lubricants with no quality certificates IS FORBIDDEN!


4.4.13 Quality certificates (certified copies thereof) for the provided fuel and lubricants shall be submitted to the aircraft flight crew member or representative of the Operator upon his/her request prior to the aircraft refueling. (FAR 128 "Preparation and Operation of Flights in Civil Aviation")

4.4.13.1 A quality certificate shall specify:


- type of fuel
- density
- temperature

This data is subsequently entered into the fuel order form. The fuel order may also include information from the fuel truck voucher. In case the fuel order is printed automatically, it shall contain fuel data obtained through the flow densitometer.

4.4.14 General requirements

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- 4.4.14.1 Before refueling it is necessary to make sure of the availability of wheel chocks and grounding, cleanliness of the fueling connectors, availability of seals and calibration marks of fuel quantity meters on the refueling equipment.
- 4.4.14.2 The handling company which provides refueling/defueling services connects and disconnects the fueling connector(s) to the aircraft's onboard fueling connection(s) under supervision of the aircraft flight crew member or representative of the operator.
- 4.4.14.3 Aircraft refueling (control of valves and cocks on the aircraft fueling panel) is carried out by the aircraft flight crew member or representative of the operator.
- 4.4.14.4 Refueling (under a contract) may be carried out by persons from other organizations with certificates of a TU-204 and Boeing 757 200F aircraft maintenance facility.
- 4.4.15 Requirements for refueling/defueling:
- in case of fire on or near the aircraft, refueling is prohibited;
 - fire extinguishing equipment should be easily accessible;
 - no shortwave radio equipment may be broadcast or tuned during the refueling process. It is prohibited to switch on the weather navigation radar;
 - it is prohibited to use cell phones, portable radios, and other portable electronic equipment while refueling;
 - any equipment with metal wheels or metal spikes or tire chains that can produce sparks should not move in the safety area;
 - the positioning of ground support equipment used for aircraft handling must comply with the layout of ground support equipment (Section 4.2.4. of this GHOM)
 - it is forbidden to position the equipment (including ladders, stairs and fuel trucks) in the immediate vicinity of the aircraft to prevent damage due to its lowering during the refueling.
 - the escape routes for the refueling equipment (vehicle) must be free to ensure its rapid withdrawal in case of emergency;
 - to remove static electricity, potential equalization must be done between the aircraft and refueling equipment before the fuel hoses are connected;
 - the fuel tanks or tanks on a trailer must always be connected to the tractor or vehicle;
 - the hose pipes (hoses) shall be stretched along the routes which protect them from being run over by vehicles involved in the aircraft handling.
 - any ground support equipment should be at least 3 ft/1 m away from the fuel supply lines. The fuel truck and fuel hoses must not obstruct access to the aircraft cabin and cargo compartment doors;
 - the speed of the fuel truck in the aircraft handling area shall be limited to the speed of a pedestrian (5-6 km/h);
 - during the aircraft refueling, the fueling panel and fire extinguishing equipment shall be freely accessible;
 - the operator refueling the aircraft must control the refueling process and stay outside the fuel truck;
 - during the refueling process the personnel responsible for ground handling must control the refueling of the fuel tanks before the automatic closing of the fueling valves in order to avoid the hydraulic shock. Therefore, before closing the valves, the pressure in the refueling line from the fuel truck must be reduced from the standard pressure (3.7 kg/cm²) to 2.5 kg/cm²;

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- before driving away from the aircraft, the fuel truck operator must make sure that all hoses, grounding cable and potential equalization cable are disconnected and removed;
- it is forbidden to connect or disconnect any electrical equipment, including the ground power unit;
- during the refueling, the initial start or restart of the APU is allowed if the APU was previously shut down in a regular way. It is forbidden to start the APU in case of the aircraft refueling after a failed start. In this case, before starting the APU it is necessary to make sure that the refueling has been finished and the refueling hose disconnected. The APU may be shut down manually or automatically during the refueling process;
- if a fuel spill occurs, any refueling operations must be stopped, and the remedial action taken in accordance with the local airport regulations;
- if any fuel leaks or other hazards are detected, the refueling must be stopped immediately until such hazardous conditions are eliminated;
- it is prohibited to use an engine heater during the refueling process.

4.4.16 Ensuring safety in case of a fuel spill

4.4.16.1 In case of a fuel spill, it is necessary to:

- immediately stop refueling the aircraft;
- immediately notify the fuel truck operator and the Airline representative / aircraft pilot-in-command about the situation;
- notify the firefighting service/department and relevant airport services and not proceed with any work until their arrival;
- limit all work within a radius of 15 meters from the boundaries of the spill zone.


4.4.17 Control of the refueled aviation fuel and interaction with fueling companies

4.4.17.1 At the request and in the presence of the Airline employee, an employee of the fueling company takes aviation fuel from the regular sampling point (after the water separating filter) into a visualization retort for checking (at least 1,5 liters) before refueling and after bleeding of 1000 liters.

4.4.17.2 The Airline employee performs visual check for absence of visible particles of contamination, water, ice crystals and mechanical impurities (sand, dirt) in the fuel.

4.4.17.3 If during such visual check by the Airline employee any inconsistencies in the aviation fuel (visible particles of contamination, water, ice crystals and mechanical impurities (sand, dirt) are detected, the sampling shall be repeated. In case of any repeated unsatisfactory quality control results, the following procedure shall be implemented:

- Report the presence of contaminants, water, ice crystals and/or mechanical impurities to the relevant fueling company employee,
- Order to stop refueling the aircraft,
- Report the detection of contaminants, water, ice crystals and/or mechanical impurities to the aircraft pilot-in-command / Airline representative,
- Report to the Airline Operation and Dispatch Department,
- Make sure that the fueling company employee has reported the detected ground handling irregularities to the shift operations manager and GH agents,
- Upon arrival of the fueling company officials, safety inspectors, etc., take part in the inspection of the received samples and take samples from the underwing refueling nozzle and perform visual and instrumental quality control (with the help of POZ-T quality control objective means (with infrared equipment), with further drawing up

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and signing of a report (in F-6 form) specifying the decision (unsatisfactory quality control results are recognized in case of 3 prints on the white layer of the fuel quality indicator darker than the control print (mechanical impurities) and / or over 2 blue prints on the yellow layer of the fuel quality indicator (water).

- The decision to suspend the fueling company from refueling shall be made by Airline representative /pilot-in-command and the shift operations manager based on the quality control results obtained in the fuel sample taken from the underwing refueling nozzle.

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4.5 TU-204C and TU-204 100C aircraft ground handling

4.5.1 Layout of TU-204C; TU-204 100C aircraft servicing points

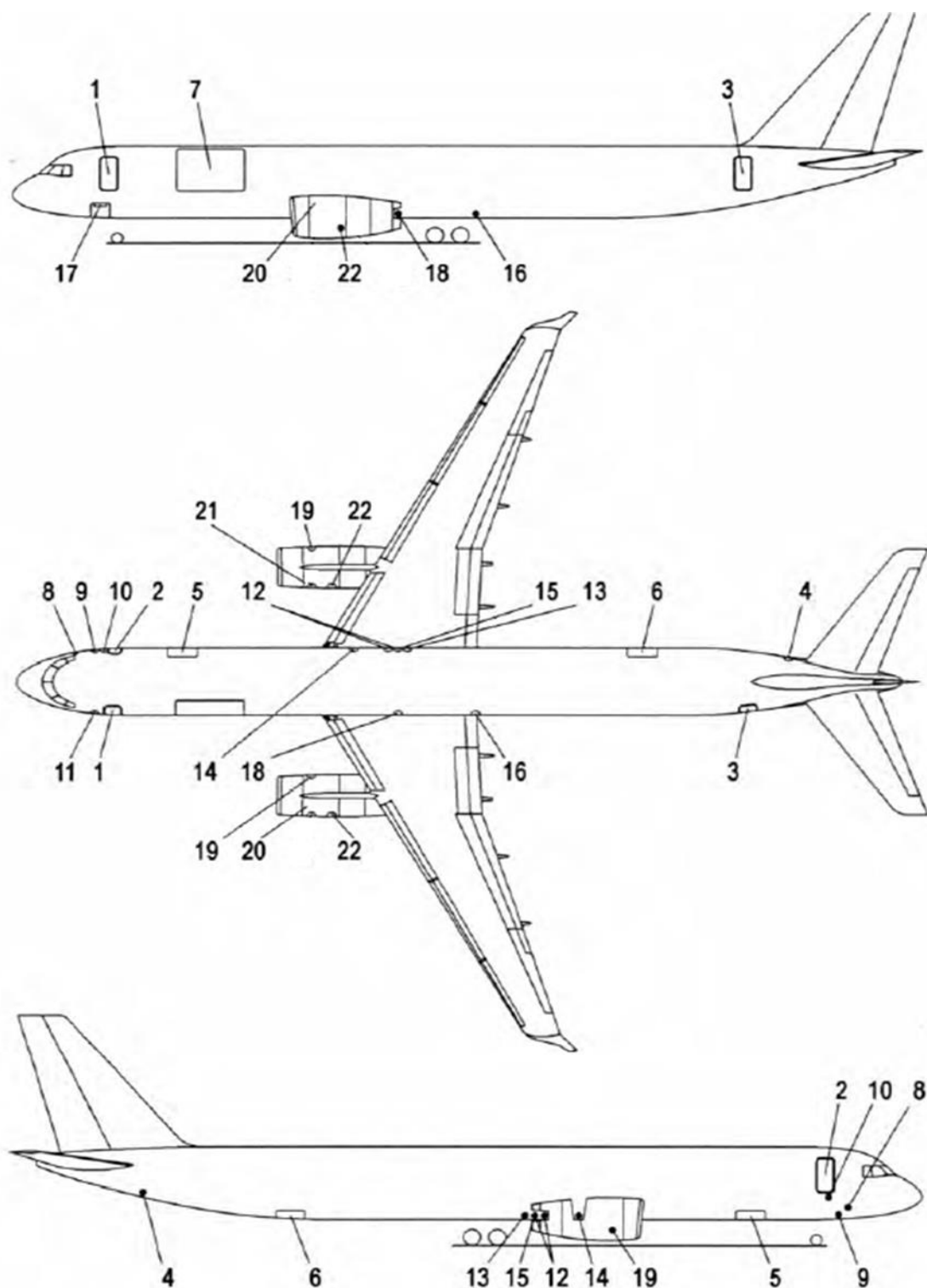



Figure 06. Layout of aircraft servicing points used for ground handling.

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4.5.2 Table of servicing points

No.	Maintenance area No.	Servicing point description	Location on aircraft
1	821	FWD entry door	Frame 8-10, port
2	822	FWD service door	Frame 8-10, starboard
3	823	AFT entry door	Frame 74-76, port
4	910.3A	APU oil service door	Frame 78-79, belly, starboard
5	115.2A	FWD BCC door (BCC-1)	Frame 15-18, starboard
6	126.2A	AFT BCC door (BCC-2)	Frame 62-65, starboard
7	843	Cargo door	Frame 16.23, port
8	113.2A	Oxygen charging panel access door	Frame 5-6, starboard
9	113.2B	Water service panel access door	Frame 7-8, starboard
10	113.2B	Ground power panel and aircraft grounding receptacle (to be used at parking)	Frame 8-9, starboard (TU-204-100C) /NLG bay (TU-204C)
11	113.3B	Waste water service panel door	Frame 7-8, port
12	140.3Ж 140.3И	Fuel connection access doors	Frame 37-39, right wing-root fairing
13	140.3K	Fuelling station access door	Frame 39-40, right wing-root fairing
13*	140.3K	Fuelling station	Frame 39-40, right wing-root fairing
14	140.3Г	Hydraulic system service panel access door	Frame 33-35, right wing-root fairing
15	140.3Д	Hydraulic system nitrogen charge panel access door	Frame 38-39, right wing-root fairing
16	130.3Ж	Ground air conditioning access door	Frame 46-47, left wing-root fairing
17	114.1B	Tank charge panel – hydraulic compensator of the cargo door control system	Frame 7-9, NLG left side
18	130.3Д	GS-2 panel access door for the ground unit connection	Frame 38-39 left wing-root fairing
19	412.2B 422.2B	ASU connection access doors	Right side of the left and right engine nacelles
20	412.1A	Nacelle door for access to the ground unit connection valves for GS-1	Left engine (Nacelle left side)
21	422.1A	Nacelle door for access to the ground unit connection valves for GS -3	Right engine (Nacelle left side)
22	412.1B	Engine heater access doors	Left side of the left and right engine nacelles

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4.5.3 Appearance of some servicing points

- FWD entry door:

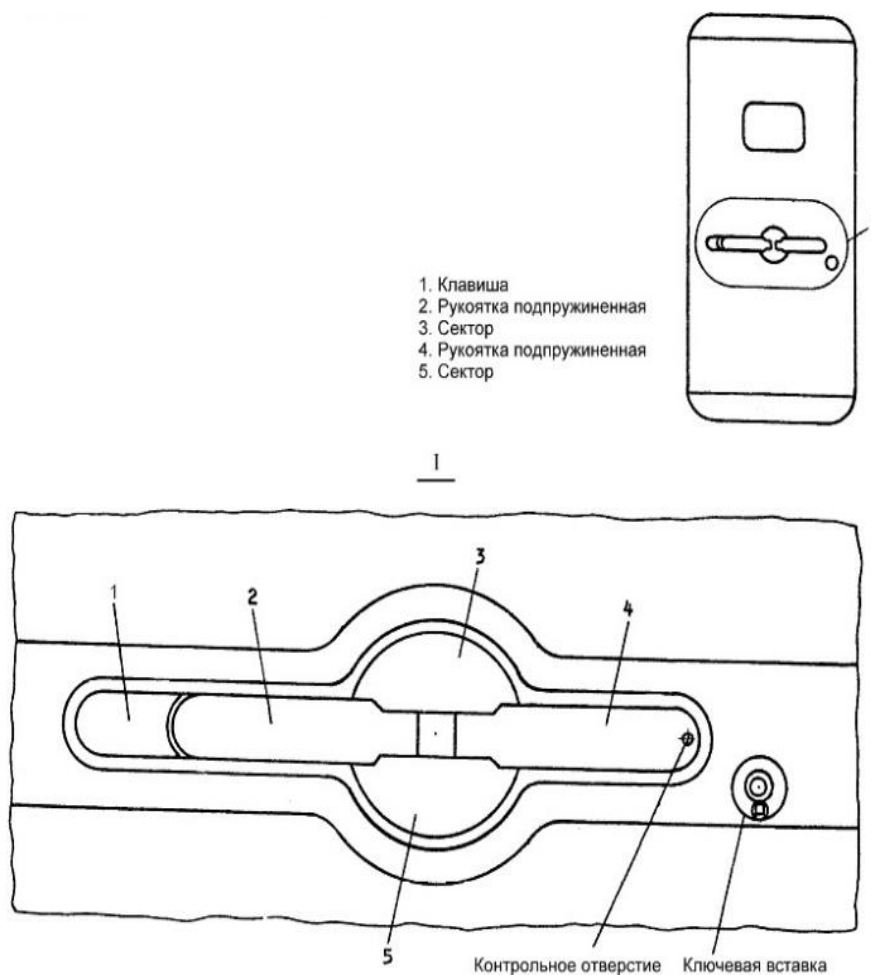


Figure 07. FWD entry door

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- BCC doors and BCC opening scheme:

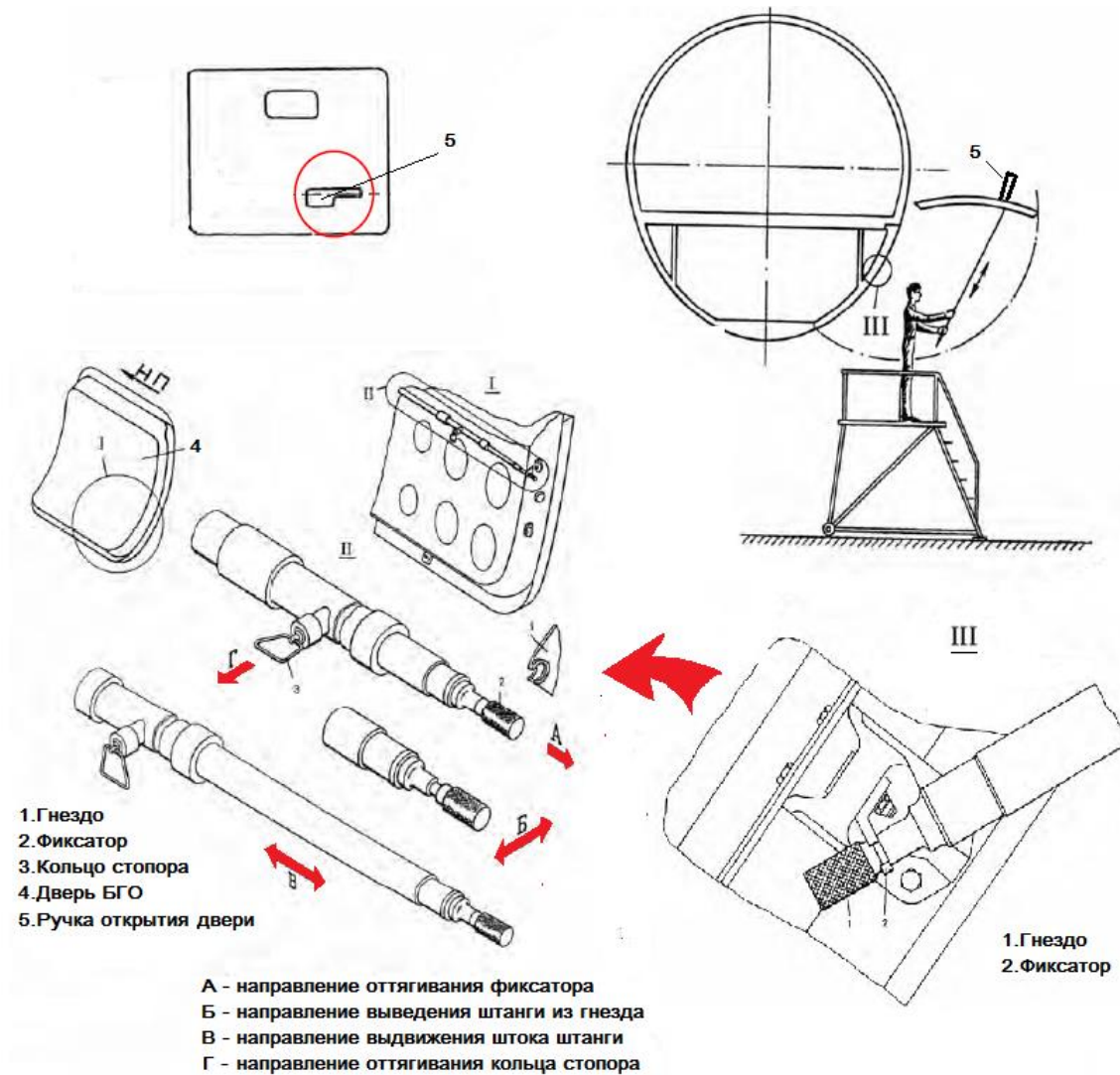


Figure 08. BCC doors and BCC opening scheme

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- Potable water access door and service panel:

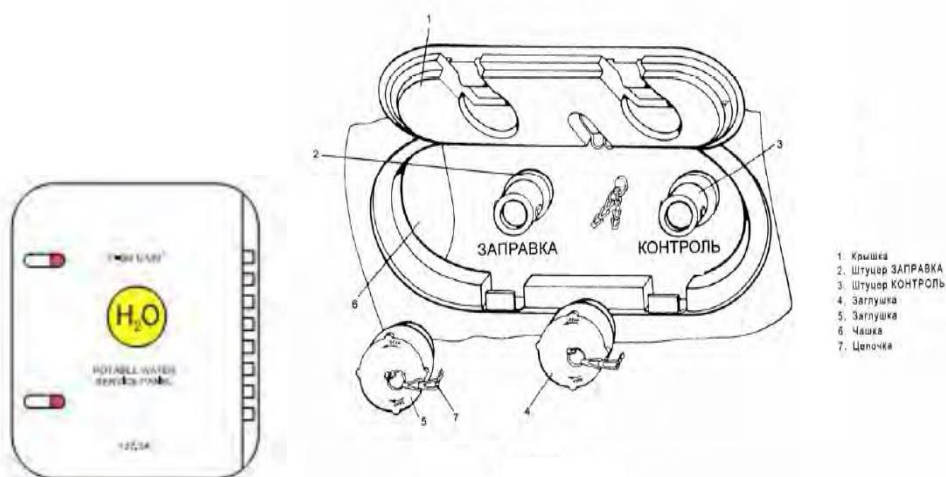


Figure 04. Potable water access door and service panel

- Waste water access door and service panel:

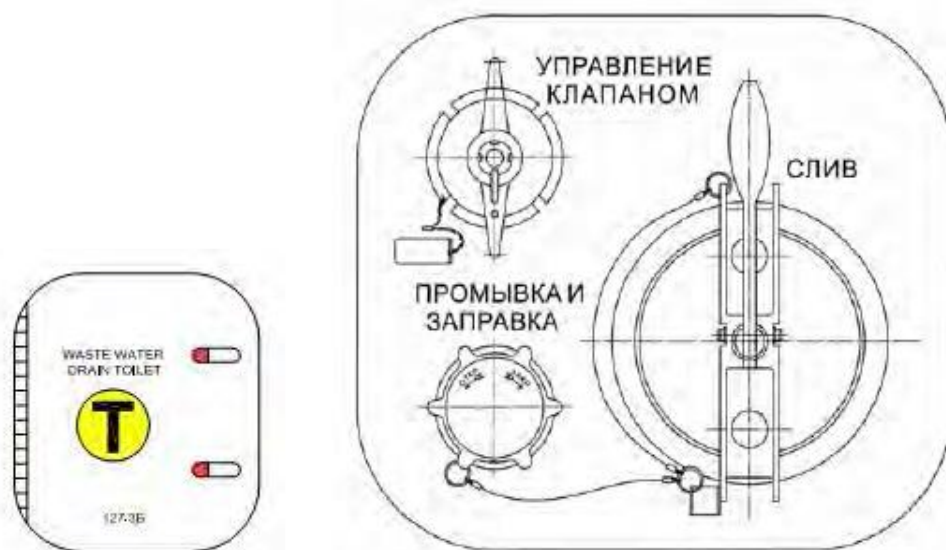


Figure 09. Waste water access door and service panel

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- Ground power panel and aircraft grounding receptacle (TU-204C)

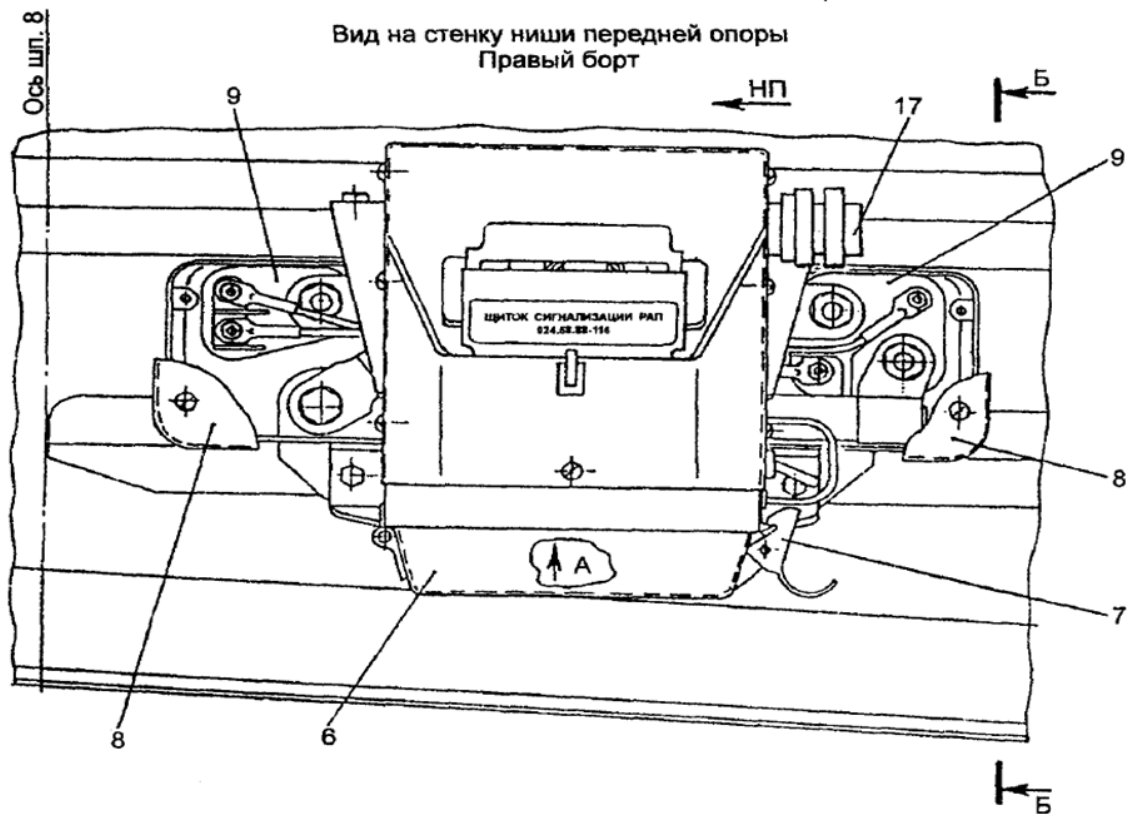
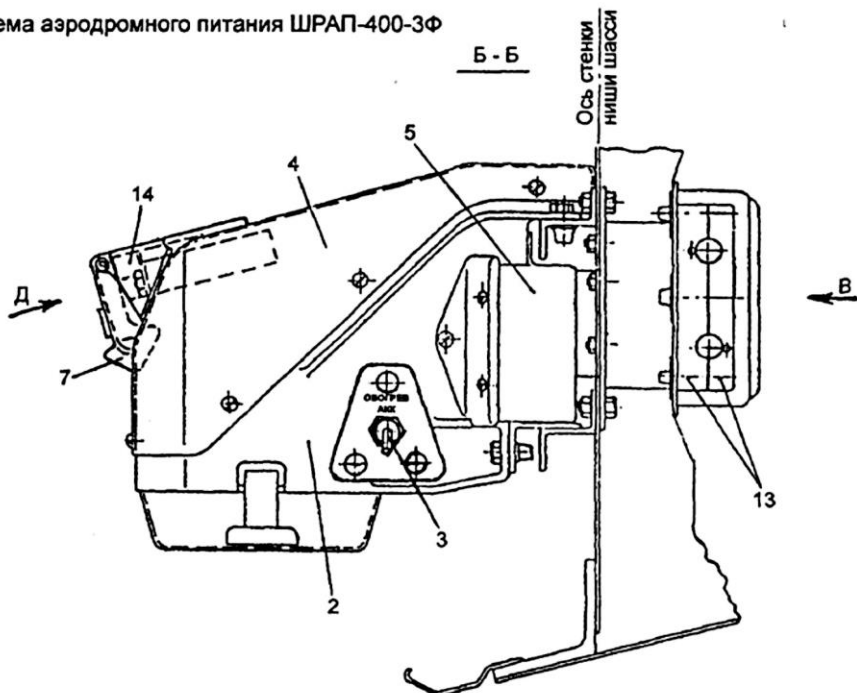


Figure 10. Ground power panel and aircraft grounding receptacle (TU-204C)

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Figure 10 a. Ground power panel and aircraft grounding receptacle (TU-204C)

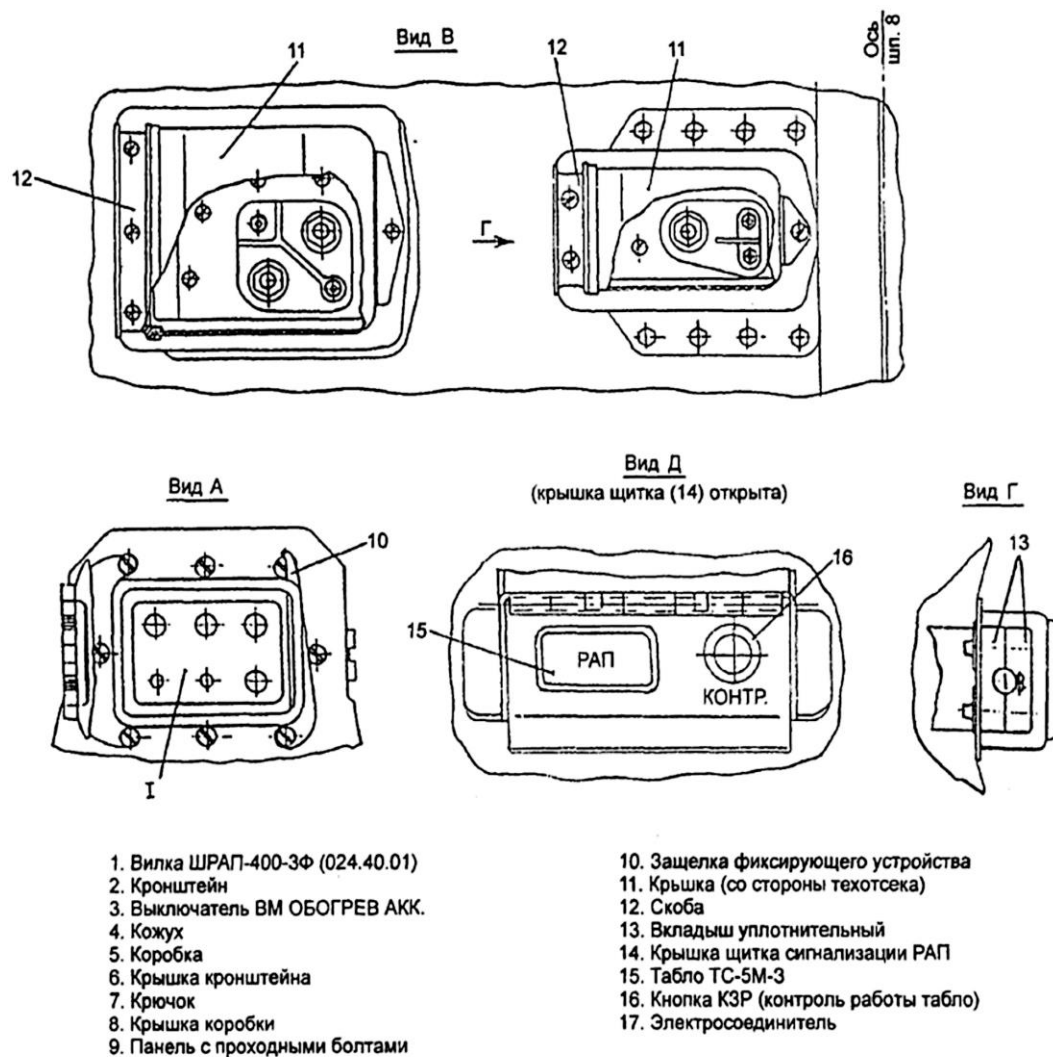


Figure 10 b. Ground power panel and aircraft grounding receptacle (TU-204C)

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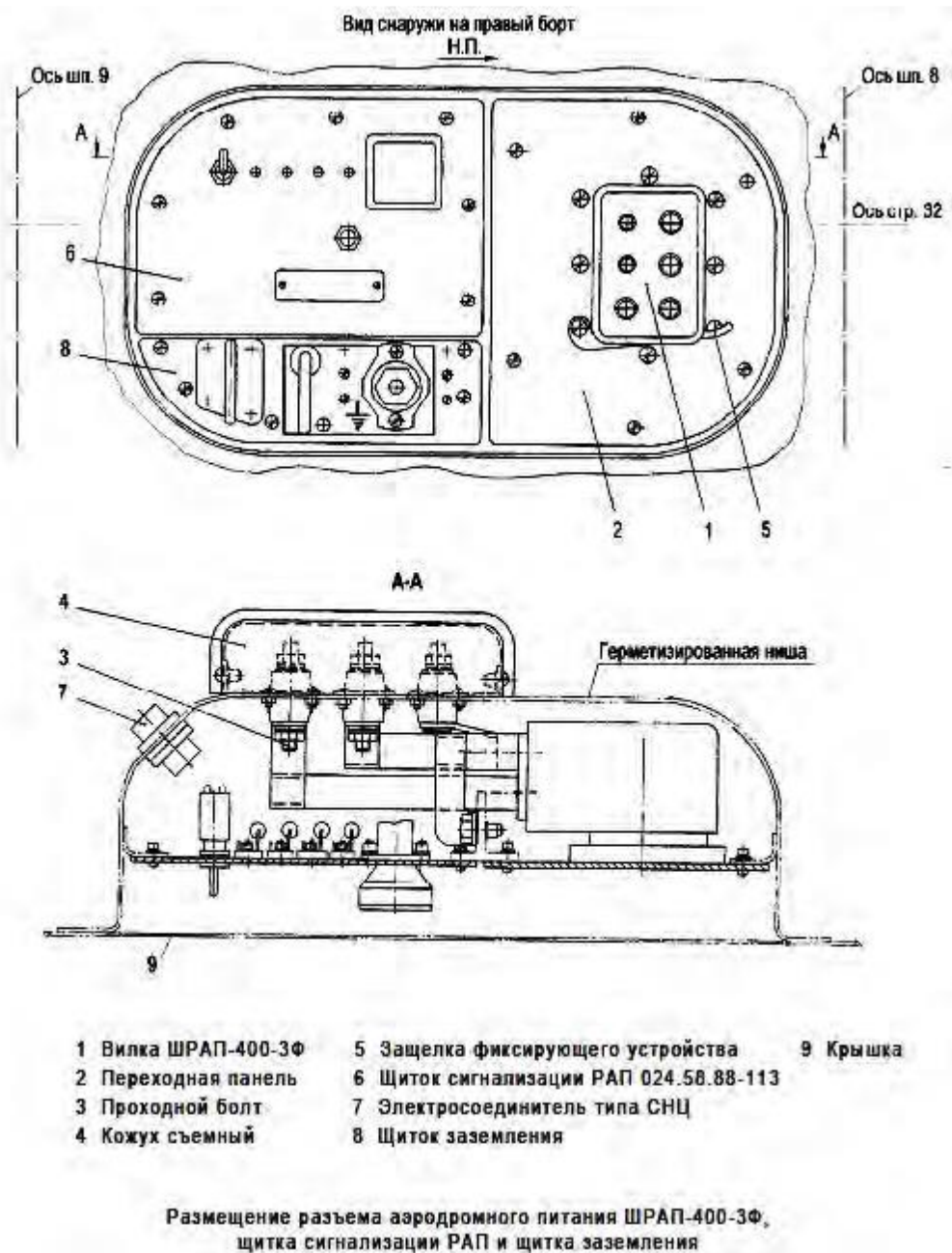
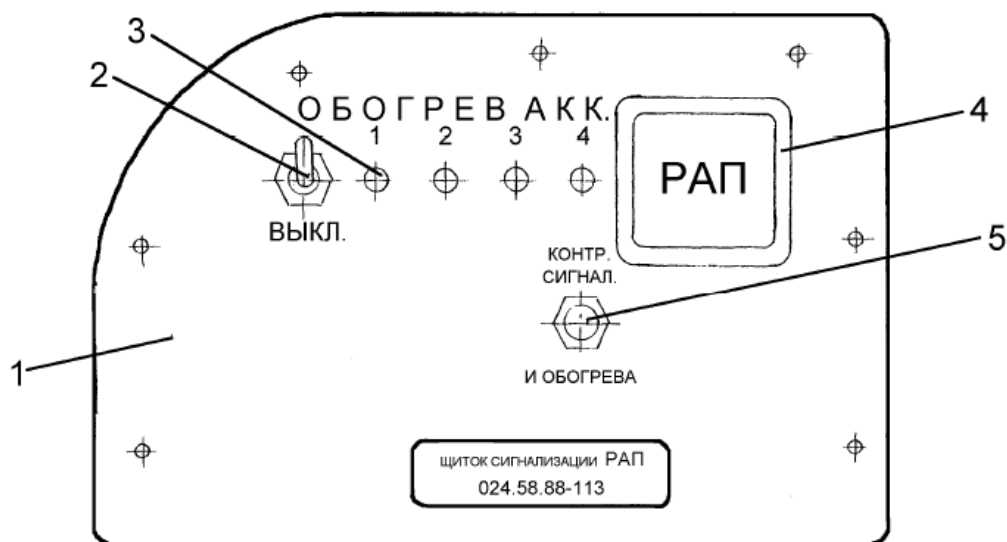


Figure 10 c. Ground power panel and aircraft grounding receptacle (TU-204C)

- External power receptacle (RAP) alert panel (TU-204-100C)



1. Панель
2. Выключатель
3. Светодиод
4. Сигнализатор
5. Кнопка

Figure 11. External power receptacle (RAP) alert panel (TU-204-100C)

- Fuel/defuel connections

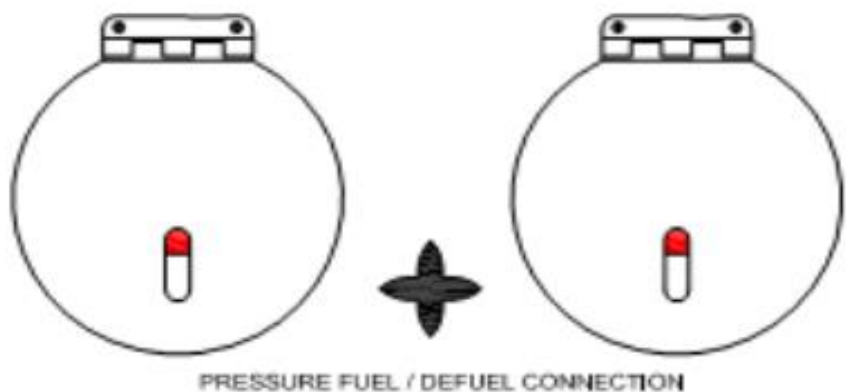


Figure 12. Fuel/defuel connections

– Fueling station

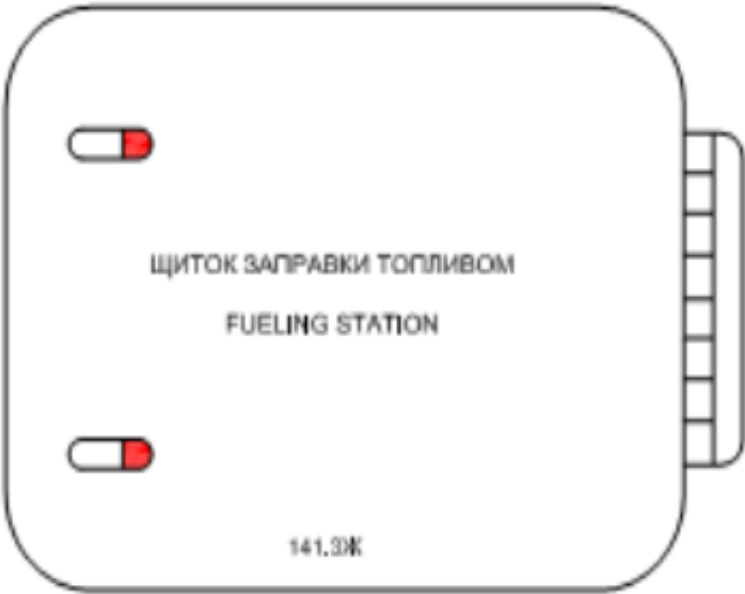


Figure 13. Fueling station

– Fueling control panel

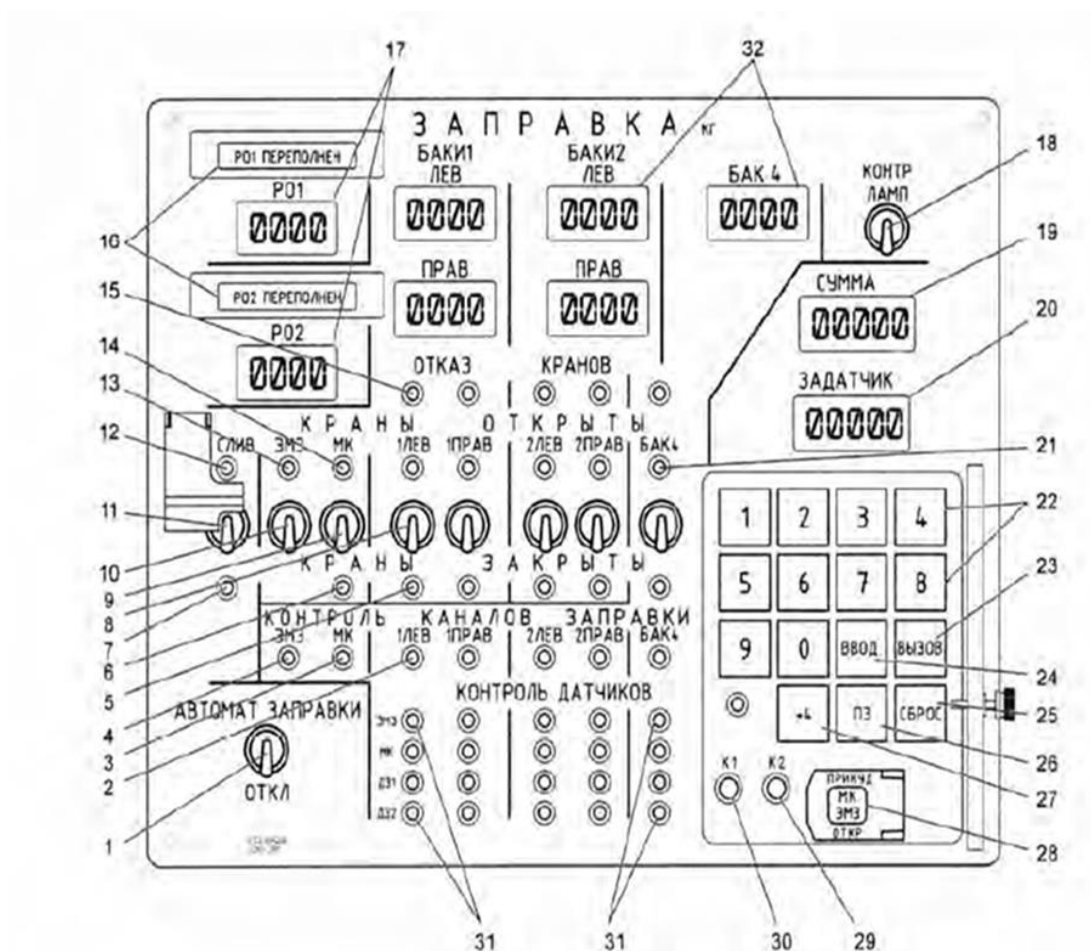



Figure 14. Fueling control panel

1. Automated refueling switch
2. Tank filling channels operation indicators
3. Main fuel valve channel operation indicator
4. Fuel shut-off valve channel operation indicator
5. Fuel valve closed position indicators
6. Main fuel valve closed position indicator
7. Drain valve closed position indicator
8. Fuel valve opening switches
9. Main fuel valve opening switch
10. Fuel shut-off valve activation switch
11. Drain valve opening switch (under the cap)
12. Drain valve open position indicator

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13. Fuel shut-off valve activation indicator
14. Main fuel valve open position indicator
15. Fuel valve failure indicators
16. Fuel reservoir overflow display
17. Fuel reservoir fuel quantity indicators
18. Panel lamp and indicator control button
19. Total fuel indicator
20. Selector indicator
21. Fuel valve open position indicators
22. Patch panel buttons
23. Button for displaying the selected fuel quantity on the fuel indicator
24. Button for entering the selected data
25. Button for resetting the erroneous data
26. Full refueling ON button
27. Button to activate tank 4 refueling in case of full refueling
28. Main fuel valve and fuel shut-off valve forced opening button (under the cap)
29. Main fuel valve and fuel quantity sensor channel control button
30. Fuel shut-off valve sensor channel control button
31. Fuel shut-off valve, main fuel valve, fuel quantity sensor-1 and fuel quantity sensor-2 sensor channel control indication

– Ground Air Condition Connection

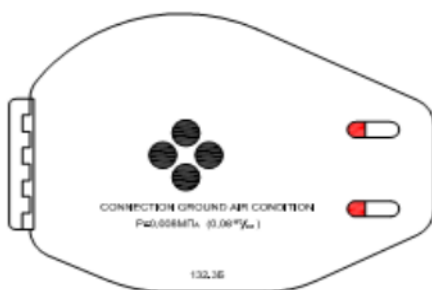


Figure 15. Ground Air Condition Connection

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- ASU connection access door

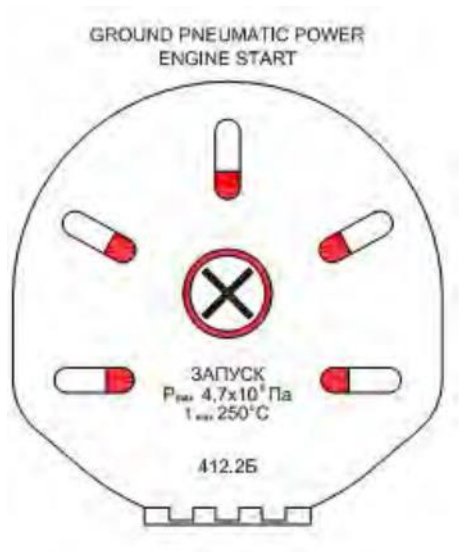


Figure 16. ASU connection access door

- Engine heater access door

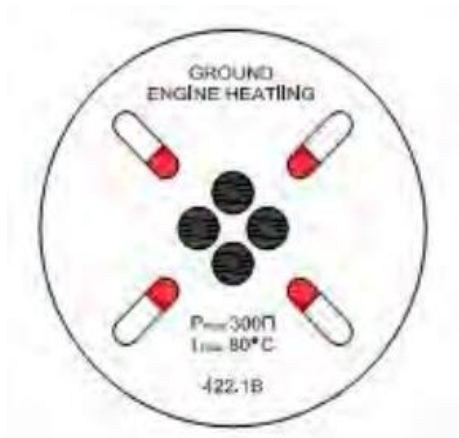



Figure 17. Engine heater access door

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4.5.4 Preparing for the aircraft arrival


- 4.5.4.1 Before the aircraft arrives at its parking stand, it is necessary to assess the sufficiency of the parking stand, number of the personnel involved and equipment used subject to the type of the arrived aircraft in order to ensure safe performance of all work. As a minimum, the following equipment should be available:
- wheel chocks;
 - headphones for communication with the pilot-in-command;
 - wands (regular and light/battery powered, depending on the time of day);
 - ground power unit;
 - air conditioning unit (if necessary).
- 4.5.4.2 The personnel performing functions provided for in the aircraft arrival procedure must be outside the danger areas.
- 4.5.4.3 The personnel not involved in installation of the wheel chocks must stay away from the aircraft until they receive a command to do other work from the person in charge of the aircraft arrival.
- 4.5.4.4 The means of control during the aircraft arrival are the automatic stand entry guidance system or manual controls (wands).
- 4.5.4.5 The ground personnel and equipment should remain in their normal positions until the aircraft fully stops at the stop line, the engines and the flashing lights are switched off. In course of aircraft entering the parking area, the ground support equipment should be positioned so that its limiting points do not overlap with the aircraft movement path and, if possible, are parallel to the fuselage or centreline.
- 4.5.4.6 Under any circumstances, the ground support equipment must not cross the aircraft taxiing path. The aircraft always has the right of priority when moving.
- 4.5.4.7 When parking the aircraft, it is necessary to take into account that the pilot has limited “forward” visibility due to the aircraft design features.

4.5.5 Actions before the aircraft arrival

- 4.5.5.1 Before the aircraft arrival it is necessary to:
- make sure that the parking stand is able to accept this type of aircraft, the ramp markings are clearly visible, the stop line of the NLG wheel for this type of aircraft is marked with the proper marking;
 - make sure that all ground support equipment is withdrawn from the manoeuvring area, and there is a sufficient distance between the aircraft and facilities / equipment;
 - make sure that all the equipment necessary for aircraft arrival is available on the ramp (wheel chocks, stairs, built-in grounding receptacles, firefighting equipment, etc.).

4.5.6 Aircraft arrival at the parking stand

- 4.5.6.1 Regular sequence of operations upon aircraft arrival at its parking stand after the aircraft has entered the parking stand:
- aircraft taxiing into the parking stand is carried out according to the signals of the automatic stand entry guidance system (herewith, the aerodrome service shall be responsible for the correct operation of the system), or according to the signals of the employee in charge of ensuring the absence of obstacles in the aircraft maneuvering area.

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- after the aircraft has stopped in accordance with the markings, the flight crew engage the parking brake, switch off the engines and flashing beacon;
- the aircraft ground handling supervisor establishes communication with the pilot-in-command and receives his/her confirmation that the aircraft parking brake is engaged;
- the handling personnel install the wheel chocks at the command of the aircraft ground handling supervisor;
- the employee responsible for installation of the wheel chocks gives the “Chocks on” signal to the aircraft ground handling supervisor;
- the aircraft ground handling supervisor brings this information to the notice of the aircraft pilot-in-command;
- a ground power unit is connected, if necessary;
- a visual inspection of the aircraft is performed.

ATTENTION!

As an exception, it is possible to position the ground power unit in the handling area before the engine switch-off. In this case the chocks are first temporarily installed under the NLG wheels. After the GPU has been engaged and the engine rotors have been switched off and stopped, the chocks are installed under the MLG wheels. Thereafter the chocks shall be removed from the NLG wheels.

4.5.6.2 Chocking the aircraft wheels (requirements for wheel chocks):

- the chocks must match the size and type of the tire and fit the tire full width;
- the chocks are set parallel to the wheel axle at a distance of 5 cm to the tire;
- the chocks need to be stored in a designated place in order to avoid the possibility of damage to the aircraft;
- the chocks are installed only after the aircraft has fully stopped at its parking stand, the engine rotors stop turning, the flashing lights turn off, and after the aircraft ground handling supervisor gives permission for the handling personnel to approach the aircraft;
- the handling personnel must be aware of the danger areas around the landing gear bogies (brakes and wheels can become very hot when braking), and the protrusions of the landing gear doors, which are areas of high injury risk;
- it is forbidden to remove the chocks without permission of the aircraft ground handling supervisor.


ATTENTION!

When installing the wheel chocks, it is necessary to position oneself so as not to get under the wheel in case the aircraft starts moving before the chocks are put in place.

4.5.6.3 The procedure for aircraft arrival, parking, and connecting the ground power unit to the aircraft with an unserviceable APU.

4.5.6.3.1 In case of an unserviceable APU, it is necessary to connect the ground power unit according to the following procedure:

- the ground handling supervisor / departure coordinator shall direct actions of the personnel ensuring the arrival and parking of aircraft;
- The personnel responsible for ground handling:
 - a) make sure that the specified areas are free of equipment, vehicles, personnel and foreign object debris;
 - b) control the NLG wheels positioning marking for this type of aircraft;

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- c) provide the ground power unit;
- d) ensure the aircraft taxiing into the parking stand according to the marking and airport procedure requirements;
- e) comply with the safety requirements when working on the aircraft with its engines running at the parking stand. Visually confirm the aircraft stop after the "Stop!" command from the ground;
- f) at the command of the responsible person, provide ground communication with the cockpit via intercom (the intercom receptacle is installed at the nose landing gear);

Note. Approach to the NLG may be possible only from the nose side of the aircraft;

- g) give command to the crew to engage the aircraft parking brake and receive confirmation of its engagement;
- h) install the wheel chocks under the NLG wheels;
- i) open the connection access hatch and implement the procedures for connecting the GPU;
- j) after checking the connection of power supply to the aircraft:
- k) give command to turn off the engine;
- l) monitor the engine to a full stop;
- m) monitor the flashing beacon switch-off;
- n) at the command of the ground handling supervisor / departure coordinator install chocks under the MLG wheels;

ATTENTION!

Be particularly careful, as the engine rotors may continue to rotate due to inertia or wind!

- o) remove the chocks from the NLG wheels.


4.5.7 Aircraft external inspection

4.5.7.1 The aircraft external inspection procedure shall be implemented in the following cases:


- after positioning the aircraft at the parking stand upon arrival, after installing the wheel chocks in place, and until positioning the ground support equipment in the handling area;
- prior to the aircraft departure before removing the chocks and after removing the ground handling equipment from the handling area.

4.5.7.2 The external inspection is a visual inspection for damage to the following aircraft areas:

- all cargo compartment doors;
- all passenger doors;
- all access hatches, doors and panels to the aircraft servicing points;
- fuselage, wings and empennage;
- air intakes, engine cowls and exhaust nozzles.

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- 4.5.7.3 To implement the aircraft external inspection procedure at night it is necessary to use a sufficiently bright hand-held electric light.
- 4.5.7.4 When carrying out the external inspection, if any damage not included in the skin damage list is detected, it should be immediately reported to the aircraft maintenance personnel, and in case of their absence, to the Airline representative or pilot-in-command.
- 4.5.7.5 During the inspection, it is necessary to pay special attention to the absence of visible damage to the doors, cargo door and baggage compartment doors.
- 4.5.7.6 The following aspects shall be considered when carrying out the aircraft external inspection:
- the sensors, pitot-static probes are clean and undamaged;
 - the skin in the pitot-static probe area is not deformed;
 - the cockpit window glasses are intact;
 - any unused doors, hatches and access panels are locked and undeformed;
 - the aircraft surfaces and structural elements have no external damage, all parts are in place and there are no fluid leaks;
 - no absence of fastening elements - such as screws, bolts and rivets;
 - the nose landing gear and its elements have no external damage; there are no fluid leaks; wheel tires are not too worn, have no damages, no tread separation; the landing gear shock absorbers are not fully compressed;
 - all antennae are intact;
 - the fwd baggage compartment door and door opening are undamaged;
 - the lenses of lights and beacons are clean and undamaged;
 - the air intake, outer skin, nozzle, visually visible compressor, engine and turbine blades are undamaged;
 - the wing surfaces and components are clean and free of damage;
 - there are no fluid leaks;
 - the static dischargers are not damaged;
 - the air navigation light lenses are clean and undamaged;
 - the main landing gear and its elements have no external damage; there are no fluid leaks; wheel tires are not too worn, have no damages, no tread separation; the landing gear shock absorbers are not fully compressed;
 - the aft baggage compartment door and door opening are undamaged;
 - the water system drainage is clean;
 - the safety valves of the aircraft pressurization system are closed;
 - the static ports are clean and undamaged.
- 4.5.8 Opening/closing of aircraft doors and hatches
- 4.5.8.1 All aircraft doors and hatches must be opened only by the properly trained and authorized personnel. They may only be opened after the:
- aircraft full stop;
 - engine shutdown;
 - parking brake engagement;
 - flashing beacon switch-off;
 - installation of wheel chocks;
 - receipt of the appropriate authorization from the departure coordinator.

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4.5.8.2 The doors and hatches shall be held open by regular equipment only. Otherwise, there is a risk of injury during these operations.

4.5.8.3 If any door or hatch is found open and there is no ground support equipment for that system in the handling area, immediately report it to the ground handling supervisor or the Airline representative. Never close hatches or doors unless you are trained and qualified to do so. Keep an open hatch under control until it is closed by the authorized personnel.

Note. Before opening any door, the area around the door should be inspected to make sure there is no damage. If any irregularities are found, it is necessary to immediately inform the departure coordinator.

4.5.9 Opening the door from the inside by the technical personnel or crew

4.5.9.1 It is necessary to make sure that the emergency escape system of the door is not activated and that all the indicators confirm this state. Visually check the presence and condition of the internal door hardware. The door should be opened slowly according to the instructions and markings on the inside or the procedure specified in the aircraft manufacturer documents.

4.5.10 Opening the door from the outside with the crew on board

4.5.10.1 To request the crew about the possibility to open the door, the ground personnel should use a triple knock on the aircraft door window. In case of no response, it is necessary to repeat the signal and, if that does not help, contact the pilot-in-command regarding the possibility to open the door. If you do not receive any confirmation that the aircraft door can be opened, it is forbidden to open the door.

Note. To inform the crew about the possibility to open the door, the ground personnel should use the following standard signal - a triple knock on the door window.

4.5.10.2 A standard signal indicates that the ground support equipment is positioned in its regular locations and the door is ready to be opened. The technical personnel should assist the crew in opening the door (if possible).

4.5.10.3 In case of a positive answer, the door should be opened slowly to the fully open and locked position in accordance with the instructions and markings on or near the door or with the procedures specified in the aircraft manufacturer approved documents.

4.5.11 Opening of cargo compartment doors

4.5.11.1 The personnel with no theoretical and practical training and unauthorized for any such work are forbidden to open any cargo compartment doors.

4.5.11.2 Manual operation of the electric or hydraulic cargo compartment door actuator is allowed only to the engineering and technical personnel or flight crew members.

4.5.11.3 It is prohibited to open the cargo compartment doors until the engines are fully stopped and the flashing beacon is switched off.

4.5.11.4 Before opening the cargo compartment doors, make sure they are not damaged. If any damage is found, immediately report this to the pilot-in-command.


4.5.11.5 It is allowed to open the cargo compartment doors from a stepladder or special equipment equipped with a lifting device.

4.5.11.6 Opening of cargo compartment doors is allowed only in accordance with the instructions for that type of aircraft.

4.5.11.7 Before opening the cargo compartment doors, it is necessary to provide sufficient space to prevent them from coming into contact with the equipment that keeps them from free opening.

ATTENTION!

If the cargo compartment doors cannot be opened, do not use any excessive force or attempt to use tools or ground handling equipment for their opening. Call for the engineering and technical personnel immediately

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4.5.12 Closing of cargo compartment doors

4.5.12.1 The personnel with no theoretical and practical training and (or) unauthorized for any such work are forbidden to open any cargo compartment doors.

4.5.12.2 Manual operation of the electric or hydraulic cargo compartment door actuator is allowed only to the engineering and technical personnel or flight crew members.

4.5.12.3 Before closing the cargo compartment doors, it is necessary to make sure that:

- the cargo in the cargo compartment is secured in accordance with the instructions for this type of aircraft;
- all safety nets are properly secured and do not interfere with the door closing;
- the lighting in the cargo compartment is off (unless otherwise required for the transport of animals);
- the door surface and frame are free of gravel, water, ice and other foreign objects;
- there are no signs of damage to the door surface and frame.

Note. In case of any detected damage, it is necessary to immediately report this to the pilot-in-command.

ATTENTION!

Reopening of the door after its closing is possible only after requesting the pilot-in-command to open the door.


4.5.13 Actions to be performed before the aircraft starts moving

4.5.13.1 The departure coordinator is responsible for inspecting the aircraft before it is dispatched from the parking stand. Any irregularities detected must be immediately reported to the crew.

4.5.13.2 When dispatching the aircraft from the parking stand, the established procedures of the departure airport must be followed. The engines will not be started until all cargo and mail are loaded, aircraft doors and hatches are closed, and any ground support equipment, other than the ground power unit and/or air starting unit, if used, is removed from the aircraft area.

4.5.13.3 When preparing the aircraft for departure, the following actions shall be carried out:

- make sure that all ground support equipment has been removed from the handling area;
- perform a visual inspection of the operations area and make sure of no foreign object debris;
- make sure of no pins in the landing gear;
- perform the aircraft external inspection (walk-around) as required by Section 4.5.7 after completing all ground handling operations (before removing the wheel chocks).
- make sure that all aircraft doors and hatches are closed and secured in the closed position with a lock, fit tightly (flush) against the opening, do not protrude beyond the aircraft surface and have no gaps;
- make sure that the engine air intakes and nozzles, air conditioning system air intakes are clean and free of foreign object debris.

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4.5.14 General requirements for the aircraft engine start-up

4.5.14.1 The decision to start the engines is made by the aircraft pilot-in-command. The aircraft engines are started by the qualified specialists trained in the prescribed manner and authorized to perform such work on this type of aircraft.

4.5.14.2 The engines may be started before, during, or after towing the aircraft, as required by the airport towing instructions.

4.5.14.3 All personnel involved in the engine starting procedure must be informed of the danger areas in the vicinity of the aircraft.

4.5.14.4 Conditions for starting the engines:


- the ground support equipment, which will no longer be used, has been removed from the aircraft parking stand and positioned in the designated area;
- the cargo door, entrance and service doors of the compartments, hatches and baggage compartment doors have been closed;
- the intercom has been tested and is working properly;
- all personnel not involved in the engine start or commencement of the aircraft towing have been removed from the aircraft parking stand;
- the inlet area and the engine jet area are free of people, equipment and foreign object debris;
- the ground support equipment required to start the engines is ready for operation;
- there are fire extinguishers available near the aircraft;
- the flight crew confirms their readiness to start the engines by turning on the aircraft flashing beacon.
- communication with the pilot-in-command must be provided through the intercom.
- the departure coordinator must immediately report to the aircraft pilot-in-command of any abnormal situations/irregularities.

4.5.15 Aircraft towing

4.5.15.1 Aircraft towing means a set of actions to move an aircraft along the airfield with the help of a tow truck/tractor in accordance with the requirements set forth in this Manual. The towing operation begins when the tow bar is connected to the tow tractor and ends when the tow bar is disconnected from the tow tractor at the location to which the aircraft has been towed. Only the duly certified personnel should be employed to tow aircraft. Towing shall be carried out in accordance with the rules laid down in the Flight Operations Manual (FOM).

4.5.15.2 The following may be used for towing TU-204C/TU-204-100C aircraft in the entire range of operating weights:

- any tow tractor with a towing capacity up to 21 ton-force (tf) and its cab rear height not exceeding 1600 mm.
- A-3127-0000-0 tow bar;
- 74.00.9942.200.000 lightweight tow bar;
- any towbar compatible with the Airbus A300/A310 type, for which the force destroying the shear bolt from the axial load is in the range of 12.5÷14 tf, and the maximum torque that the shear bolt can withstand when turning the nose landing gear is 1080÷1200 kgf-m.

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4.5.15.3 Safety requirements for towing:

- any aircraft movement operations must be performed with extreme care to prevent injury to personnel, damage to aircraft, equipment and facilities;
- only the personnel required to perform the operational functions should be in the operations area;
- the tow bar shall be connected to the aircraft with its nose wheel turning system off and after the aircraft parking brake has been engaged;
- during towing, the aircraft should have its lights on, and the tow tractor should have the flashing beacon on;
- movement shall be started after the parking brake has been disengaged;
- during the towing operation, the pilot-in-command must be in constant contact with the towing team and be ready for emergency use of the parking brake in case of any breakage of the tow bar or cutting of the shear bolt;

ATTENTION!

It is forbidden to tow the aircraft with no pressure in the emergency braking system.

- visual control of the maximum steering angle - by the lines on the NLG wheel well door and the tow bar position;
- during the towing procedure, the personnel should not stay in close proximity to the aircraft nose landing gear or the tow tractor (communication with the cockpit should be carried out by radio or through intercom);
- the personnel performing aircraft towing control or wing-walking functions must wear reflective vests and use wands or high visibility gloves during the daytime and light wands during any poor visibility/nighttime operations;
- the operations carried out in adverse weather/low visibility conditions should be carried out at a reduced speed;
- minimum distance between the personnel and tow tractor, as well as the personnel and aircraft wheels shall not be less than 3 meters;
- the tow tractor must not be left uncontrolled with the engine running;
- the chocks may only be removed after the tow tractor and the tow bar have been connected to the nose landing gear and the tow tractor parking brake has been engaged (the tow bar to be first connected to the nose landing gear, and then connected to the tow tractor);
- no towing is allowed if the extension of the landing gear shock absorbers does not meet the requirements described in the aircraft maintenance manual;
- before disconnecting the tow bar, it is necessary to obtain confirmation from the aircraft pilot-in-command about the engagement of the aircraft parking brake.

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4.5.16 Utilization of Ground Power Unit (GPU)


- 4.5.16.1 Only the duly qualified and authorized personnel with the appropriate training is allowed to operate any ground power unit.
- 4.5.16.2 Upon the aircraft arrival, the external ground power unit shall be connected after the engines have been shut down, the beacon switched off and the wheel chocks installed.
- 4.5.16.3 Upon arrival of the aircraft with an unserviceable APU, it is allowed to connect an external ground power unit with the engine running, provided that the necessary safety precautions and local airport procedures for this operation are observed. Before starting the procedure, the personnel performing the operation must be provided with reliable communication with the cockpit and authorized by the crew to start the operation.
- 4.5.16.4 The ground power unit shall be positioned at a distance of 3m from the aircraft outermost point.
- 4.5.16.5 Before the aircraft entering the parking stand it is possible to pre-position the ground power unit on the right side from the aircraft nose parallel to the aircraft centreline at a distance of 3 meters from it to the left side of the unit and 3 meters from the outermost rear point of the ground power unit to the NLG position line. The ground power unit braking system must be disengaged, or chocks must be installed under the ground power unit wheels.
- 4.5.16.6 The ground power unit receptacle is located at the aircraft nose landing gear. Make sure that the ground power unit is serviceable before you start to supply power to the aircraft.

4.5.17 Safety regulations for operations with ground power units.

- 4.5.17.1 Before connecting the ground power unit to the aircraft, it is necessary to make sure that the aircraft power connection and the ground power unit connector are clean. Foreign objects and fluids can cause overheating and/or damage to the equipment.
- 4.5.17.2 Before connecting the ground power unit to the aircraft power receptacle, it is necessary to make sure that the ground power unit is out of voltage. If it under voltage, a dangerous electrical arc may occur.
- 4.5.17.3 Before starting the ground power unit, it is necessary to make sure that its connector is properly connected to the aircraft power connection (the plug is inserted into the receptacle as far as it will go and locked to prevent it from being disconnected accidentally). There is a risk of an electric arc if the connector is not connected correctly.

4.5.18 Utilization of Air Start Unit (ASU)

- 4.5.18.1 In cases where it is not possible to ensure the start of aircraft engines in regular mode (with an APU), an ASU (Air Start Unit) shall be used.
- 4.5.18.2 Only the qualified and authorized personnel with the appropriate training is allowed to operate the air start unit. The ASU shall be positioned at a distance of 3m from the aircraft outermost point.
- 4.5.18.3 When starting the engines with an ASU:
- supply power to the aircraft;
 - check the ASU for serviceability;
 - position the ASU near the aircraft;
 - open the ASU connection hatch on the aircraft;
 - start the ASU (follow the ASU manufacturer's instructions);
 - connect the ASU hose to the aircraft;

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Note. Make sure the hose is not twisted or kinked.

- supply air to the aircraft (35-50 PSI, 2.5-3.5 kg/cm²);
- stop the air supply to the aircraft upon command from the crew;
- disconnect and command to remove the ASU from the aircraft;

ATTENTION!

Be aware of the running engine.

- close the ASU connection hatch on the aircraft;
- disconnect the ground power unit.

4.5.18.4 Stay at the parking stand until the aircraft departure in case it may be necessary to repeat the procedure.

4.5.19 Servicing the potable water system

4.5.19.1 Potable water systems are susceptible to contamination by bacteria and other microorganisms. All water intended for drinking by the crew and passengers and other personal use shall be free from chemical contaminants and microorganisms which may cause any form of health impairment.

4.5.19.2 Only the agents approved by local health authorities may be used for chlorination of potable water. If chlorine is used, it must be between 0.3 and 0.5 mg/l at the aircraft water inlet point.

4.5.19.3 The contents of the aircraft potable water service trucks must be used within 24 hours of being filled. The cleaning and disinfection of water service trucks must be done weekly. The inside of the water tanks should be cleaned once a month to remove sediments.

4.5.19.4 When servicing the potable water systems, it is forbidden:

- to refill water service trucks with potable water from the same source as the lavatory service trucks;
- to park water service trucks and lavatory service trucks at the same parking lot;
- for the personnel servicing the aircraft lavatory system, to simultaneously service the water system in the same work shift.

4.5.19.5 Before connecting the supply hose to the aircraft, it is necessary to make sure that the supply hose is completely filled with water. All outlets or tips/caps must be protected from contamination.


4.5.19.6 At low temperatures, after filling the system, it is necessary to leave the fill connection open for as long as possible to drain the remaining water from the supply line.

4.5.19.7 Install the cap on the fill connection and close the service panel door just before preparing the aircraft for towing out for departure.

ATTENTION!

If possible, keep the baggage compartment doors closed when not loading or unloading baggage/cargo. At low temperatures, the presence of water in the water supply lines can cause icing and consequently damage to the supply lines.

For Boeing aircraft: The forward BCC door shall be kept in the closed and locked position after unloading unless immediate loading is required.

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4.5.19.8 If ice is detected in the supply lines or connections, or on the service panel, immediately report this to the aircraft maintenance personnel. It is forbidden to remove any detected ice independently.

4.5.19.9 If the aircraft is parked for an extended period of time or if the aircraft stays outdoors unheated for 3 hours and at sub-zero ambient temperatures, carefully drain the system including the water tanks, boilers, water supply lines to lavatories and galleys in accordance with the procedures specified in the Aircraft Operation Manual.

4.5.19.10 Upon detection of any malfunctions affecting the possibility to service the system, immediately notify the aircraft maintenance personnel, and in their absence, the Airline representative or the aircraft pilot-in-command.

4.5.20 Specific aspects of filling and draining potable water for TU-204C aircraft

4.5.20.1 Filling and draining water are done by ground handling personnel consisting of one ground handler. At sub-zero ambient temperatures, water should be drained no later than 30 minutes after the engines have been shut down. The temperature of water to be filled must be within the range of 50...60°C.

4.5.20.2 The water filling and draining procedures do not involve radio communication.

4.5.20.3 The water tank is filled with water through the FILL connection located on the cup on of the water service panel on the right side of the aircraft nose part. The water tank full filling is determined by the water flowing out of the CONTROL (overflow) port.

4.5.20.4 At foreign airports, an adapter to the water fill connection and overflow port is used for filling and draining. The service panel door is marked with the H₂O sign.

4.5.20.5 The FILL connection and CONTROL (overflow) port are equipped with electric heating.

4.5.20.6 The following conditions must be met when filling and draining potable water:

- the water filled into the system must comply with All-Union State Standard (GOST) 2874-82 - potable water;
- the filling pressure must be 2...3 kgf/cm² (196...294KPa);
- the amount of water refilled must not exceed 36 l;
- the tank capacity of the receiving draining vehicle must be not less than 36 l;
- the temperature of water being filled must be from +3°C up to +60°C;
- the time for full filling of the tank must not exceed 5 min;
- the water is drained by gravity;
- the time for draining a fully filled system must not exceed 5 min.

4.5.21 Filling water


ATTENTION!

1. At sub-zero ambient temperatures:

- switch on the electric heating of the water service panel before filling;
- fill the water tank with water heated to 50...60°C only after the air in the aircraft has been heated to at least +5°C;
- fill the water system supply lines from the tank to the consumer taps after heating the aircraft cabin to +10° C.

2. In case of dripping from under the connection plug, the aircraft departure is prohibited.

3. Use clean wipes when wiping to avoid contamination of any connections/ports and the system.

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4.5.21.1.1 With the aircraft electrical system engaged:

- make sure there are no water leaks (or, in winter, ice) on the fuselage around the H₂O-marked water service panel door;
- open the service panel access door;
- remove the plug from the FILL connection;
- connect the tip of the water service truck hose to the FILL connection;
- switch on the water service truck pump and adjust the filling pressure from 2 to 3 kgf/cm²;
- check the amount of water to be filled visually through the CONTROL (overflow) port;
- stop filling if there are drops of water coming out of the port;
- disconnect the tip of the water service truck hose from the water service panel connection;
- make sure that the water has completely drained out of the panel connections;
- visually check the water service panel valves for leakage;
- wipe dry the connections, plugs, bay and panel door;
- check the availability and serviceability of the plug parts, and the condition of the rubber o-rings. The o-rings shall be free from tears, cracks and other defects.;
- install the plugs on the connections and close the water service panel door.

4.5.22 Draining water.


ATTENTION!

1. At sub-zero ambient temperatures, immediately drain and purge the water system after shutting down the engines before opening the BCC cargo doors. Panel heating must be on until water draining and purging is complete.

2. Use clean wipes when wiping to avoid contamination of any connections/ports and the system.

4.5.22.1.1 With the aircraft electrical system engaged:

- make sure there are no water leaks (or, in winter, ice) on the fuselage around the H₂O-marked water service panel door;
- open the service panel access door;
- remove the plug from the CONTROL port. Connect the receiving vehicle hose tip thereto;
- to drain the water tank, press and hold the mixer tap until it drips at a rate of one drop per minute;
- to completely drain water from the mixer tap, set the tap control switch on the red marking and press the tap button 2...3 times;
- open the blocking and drain valves;
- drain from the CONTROL port within 10 minutes. Disconnect the receiving vehicle hose tip from the panel port;
- make sure that the remaining water has completely drained out of the system. Wipe dry the panel connections/ports and door;
- close the drain and blocking valves. Put the plug on the port;
- close the access door on the fuselage;
- turn off the water service panel electric heater.

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4.5.23 Servicing the waste disposal system

4.5.23.1 The procedure for servicing the waste disposal system on TU-204C and Boeing 757 200F aircraft consists of the following two stages:

- draining waste water from the system storage tanks;
- rinsing the system storage tanks.

4.5.23.2 When servicing the waste disposal system, it is forbidden:

- to place the potable water service trucks and waste disposal service trucks on the same parking lot;
- for the personnel who service the waste disposal system, to simultaneously service the potable water system in the same work shift;
- to service the waste disposal system at the same time as the potable water system;
- to drain waste in the receiving tank of the vehicle not designed to service the waste disposal system.


4.5.23.3 Compliance with personal care requirements when working with the waste disposal system:

- do not allow chemical fluids to come into contact with the aircraft structure. Carefully remove traces of fluids from the aircraft skin after servicing the systems;
- make sure that the service panel drain valves are fully closed and tight at each service. Leaks from the drain valves can cause build-up of ice, which, if separated, can damage the aircraft skin.

4.5.23.4 To prevent fluid freezing in the tanks and pipes of the waste disposal systems when operating at extremely low temperatures, the following measures must be taken:

- toilet tanks must be drained if the aircraft is left outdoors unheated for 3 hours, and at sub-zero ambient temperatures;
- fill the aircraft waste disposal system only after heating up the aircraft and just before arrival of the crew;
- to prevent fluid freezing in the lines, make sure there is no residual fluid in the fill lines before putting plugs on the drain connections;
- if ice is detected in the supply lines or connections, or on the service panel, immediately report this to the aircraft maintenance personnel. It is forbidden to remove any detected ice independently.

4.5.23.5 Upon detection of any malfunctions affecting the possibility to service the waste disposal system, immediately notify the aircraft maintenance personnel, and in their absence, the Airline representative or the aircraft pilot-in-command.

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4.5.24 Specific aspects of TU-204C aircraft lavatory servicing

- 4.5.24.1 Draining waste from the waste tank is carried out by the ground handling personnel consisting of one ground handler after each flight. A special-purpose vehicle must be available for the operation.
- 4.5.24.2 Before draining, it is allowed to fill the tank with water through the panel rinse connection (or through toilets) to liquefy the waste.
- 4.5.24.3 At sub-zero ambient temperatures, the waste tank must be drained and rinsed no later than 30 minutes after shutting down the engines.
- 4.5.24.4 The time for this system ground handling (emptying, rinsing and filling the waste tank with chemical fluid) should not exceed 15 min. The waste disposal procedure does not provide for radio communication.
- 4.5.24.5 The aircraft has an international standard waste drain connection which allows the use of any other special-purpose vehicle with a receiving tank capacity of at least 70 litres if no special waste disposal truck is available.
- 4.5.24.6 The waste tank capacity shall not exceed 70 litres.
- 4.5.24.7 The volume of the chemical fluid to be filled is 10...12 litres. It is controlled by the flow meter of the special-purpose vehicle.
- 4.5.24.8 Rinsing and filling the waste tank with chemical fluid is carried out through the rinse connection of the service panel made in accordance with All-Union State Standard (GOST) 12809-67 type 1, located below on the left side of the fuselage nose part.
- 4.5.24.9 The tank shall be rinsed with hot water at 60 to 80°C after it has been drained.
- 4.5.24.10 The waste disposal system is recirculating, i.e., it provides multiple flushing of the toilet with the circulating chemical fluid filled into the tank and supplied to the toilet by the pump.

4.5.25 Draining waste, rinsing of tank and toilet.

ATTENTION!

- 1. Waste shall be drained no later than 30 minutes after shutting down the engines, regardless of the ambient air temperature.**
- 2. At sub-zero ambient temperatures, it is prohibited to turn off the service panel electric heating until the tank is drained and rinsed. Rinse the waste tank with water heated to a temperature not lower than 60°C.**
- 3. To avoid failure of the toilet flushing pump with no water in the tank, it is prohibited to push the toilet flush switch.**


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- 4.5.25.1.1 Make sure there are no fluid leaks (or ice in winter) on the fuselage around the "T"-marked service panel door
- 4.5.25.2 Open the service panel door.
- 4.5.25.3 Unlock and take off the plug from the drain connection.
- 4.5.25.4 Make sure the panel drain valve is tight by not having any fluid on the port.
- 4.5.25.5 Connect the tip of the special-purpose vehicle hose to the drain valve.
- 4.5.25.6 Release the valve control handle.
- 4.5.25.7 Open the valve by turning the control handle and pulling it to the stop.
- 4.5.25.8 After draining waste, rinse the waste tank with water without disconnecting the hose tip.
- 4.5.25.9 Remove the plug from the panel rinse connection and connect the tip of the special-purpose vehicle hose thereto.
- 4.5.25.10 Turn on the special-purpose vehicle pump and rinse the tank for 0.5...1 min.
- 4.5.25.11 Without turning off the pump, close the drain valve by pushing the valve control handle and turning it to the stop.
- 4.5.25.12 Fill the tank with 20...30 litres of water.
- 4.5.25.13 Flush the toilet.
- 4.5.25.14 Open the drain valve. After draining the fluid, disconnect the special-purpose vehicle hose tips from the connection and the drain panel port.
- 4.5.25.15 Make sure that the remaining fluid is completely drained from the system.
- 4.5.25.16 Wipe dry the port, connection, plugs and panel door.
- 4.5.25.17 Close the drain valve and lock the valve control handle in the closed position.
- 4.5.25.18 Check availability and serviceability of the port and connection plug parts, the condition of the rubber o-rings. The o-rings shall be free from cracks, tears and other defects.
- 4.5.25.19 Put the plug on the port and secure the plug with a pin.
- 4.5.25.20 Put the plug on the panel connection.
- 4.5.25.21 Close the service panel door.


4.5.26 Filling the collection tank with chemical fluid.

ATTENTION!

- 1. At sub-zero ambient temperatures, fill the collection tank with chemical fluid heated to 30...40°C only after the air in the aircraft cabin has been heated to a temperature of at least +5°C.**
- 2. In case of dripping leaks from under the connection plug, the aircraft departure is prohibited.**
- 3. The volume of the chemical fluid to be filled is from 10 to 12 litres.**

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- 4.5.26.1 Open the “T”-marked door to access the service panel.
- 4.5.26.2 Remove the plugs from the rinse connection and the drain port.
- 4.5.26.3 Connect the tip of the special-purpose vehicle hose to the rinse connection.
- 4.5.26.4 Turn on the pump and adjust the filling pressure to not more than 4 kgf/cm².
- 4.5.26.5 Control the volume of chemical fluid by the flowmeter of the special-purpose vehicle.
- 4.5.26.6 Turn off the pump.
- 4.5.26.7 Make sure that the panel drain valve is tight by absence of any leak.
- 4.5.26.8 Switch the filling vehicle pump to drain the residual chemical fluid from the filling line to the filling vehicle.
- 4.5.26.9 Disconnect the tip of the special-purpose vehicle hose from the panel connection.
- 4.5.26.10 Wipe dry the port, connection, plugs and panel door.
- 4.5.26.11 Check the availability and serviceability of the plug parts and the condition of the rubber o-rings. The o-rings must be free from cracks, tears and other defects.
- 4.5.26.12 Put the plug on the panel connection. Check the tightness of the drain valve control handle.
- 4.5.26.13 Put the plug on the port and secure the plug handle with a pin.
- 4.5.26.14 Close the service panel door.

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4.6 Ground handling of Boeing 757-200PCF aircraft

Table 2
Table of Applicability

This set of instructions is applicable to the following Boeing 757-200PCF aircraft operated by Aviacompany "Aviastar-TU" LLC:

Aircraft Reg. No.	Aircraft variant	Line number	Block No.	Aircraft Serial Number
RA-73351	B757-200PCF	566	ND184	25696
RA-73352	B757-200PCF	562	ND183	25731
RA-73354	B757-200PCF	664	ND195	27053
RA-73355	B757-200PCF	670	ND196	27054
RA-73356	B757-200PCF	680	ND198	27056

4.6.1 Parking of B757-200PCF aircraft for and over 3 hours

- 4.6.1.1 Connect the aerodrome power unit plug. Connect the ground power unit. Supply power to the aircraft.
- 4.6.1.2 Install safety devices to prevent spontaneous folding of the landing gear on the ground.
- 4.6.1.3 If necessary, at temperatures of -5 °C and below, drain the water tank and appliances (if the aircraft has been parked for more than one hour without being heated by the ground air conditioning unit). Leave the fill valve in the OPEN position.
- 4.6.1.4 Install covers on engines, pitot probes and static ports.
- 4.6.1.5 Close the exhaust valve by switching to MAN control (only at -5 °C and below).


ATTENTION!

If a ground air conditioning unit is connected to the aircraft - it is forbidden to close the exhaust valve to avoid aircraft overpressure.

- 4.6.1.6 Make sure that all doors, hatches, shutters, plugs and lavatory panel doors are closed.
- 4.6.1.7 Disconnect batteries (check disconnection), disconnect the ground power unit. Make sure that the emergency lighting is off.
- 4.6.1.8 Disconnect the aerodrome power unit plug from the aircraft.
- 4.6.1.9 Install a complete set of wheel chocks under the main landing gear (two chocks under each LG).

4.6.2 B757-200PCF aircraft towing instruction

- 4.6.2.1 Regular towing of Boeing 757 aircraft is carried out by the nose landing gear in accordance with Boeing 757 "Aircraft Maintenance Manual" Task 09-10-00-582-001.
- 4.6.2.2 Aircraft towing is carried out:
 - when being parked to the parking stand after taxiing onto the apron;
 - from the terminal apron to the parking stand after arrival;
 - from the parking stand to the terminal apron before departure;
 - from the terminal apron to the pre-start position;
 - when changing the aircraft parking stand;

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- from one hangar to another hangar;
- in case of the aircraft emergency removal from the taxiway, runway.


- 4.6.2.3 The aircraft design allows the aircraft to be towed by the nose or main landing gear. The tow fitting on the nose landing gear is intended to connect the tow bar. The maximum angle of the front wheels when towing is marked with a red stripe on the outside of the nose landing gear doors. It is prohibited to exceed this angle of rotation of the nose landing gear wheels without disconnecting the torque link.
- 4.6.2.4 It is allowed to tow (pull) the aircraft with a tow bar with one flat wheel on the nose landing gear and no more than four wheels on the main landing gear (not on one axle and not on one bogie) if the initial load is minimal. If towing with more than 6 flat tires, on soft ground, on an upward slope of more than 5°, it is necessary to connect to both main landing gears, as there will be more loads applied to the nose landing gear than the limit. Towing with flat tires causes excessive loads on serviceable wheels and requires their subsequent replacement and can also cause damage to the landing gear components, so should be used in extreme cases only. Towing should be carried out at minimum speed without large angles of the tow bar deflection. At the earliest opportunity after clearing the runway or taxiway, it is necessary to stop to replace the flat tires.
- 4.6.2.5 Tractors with the nose landing gear wheel grip (towbarless tractors) may be used to tow the aircraft, provided that the loads on the landing gear do not exceed the maximum permissible loads. The loads given below can be used for tractors with a tow bar as well as for towbarless tractors. Use the tractor manufacturer's data for selecting the equipment specific to this particular equipment.
- 4.6.2.6 Aircraft may be towed along the ways (aprons, paths) with artificial or unpaved surface suitable for towing the given type of aircraft. At darkness hours, towing shall be performed at a reduced speed with the onboard lights switched on with extra precautionary measures.
- 4.6.2.7 Towing shall be carried out subject to reliable communication between the towing supervisor and tractor driver, between the towing supervisor and qualified operator in the cockpit. Communication may be verbal through the aircraft intercom system, radio equipment or visual by signals. The towing supervisor shall be positioned within sight of the qualified operator in the cockpit and the tow tractor driver.
- 4.6.2.8 If the braking system is defective or if there is no power supply, the aircraft shall be towed with the following extra precautions:
- enhanced composition of the towing team;
 - availability of brake pads;
 - towing speed not exceeding 5 km/h.
- 4.6.2.9 If necessary, the aircraft may be towed with the engines running at no more than idle power. All safety requirements with regard to engine running danger areas must be complied with. While pushing back at departure with the good surface traction and high visibility, the engines may be started upon approval of the towing supervisor.

ATTENTION!

The use of a TOWBARLESS TRACTOR with one or both flat NLG wheels is prohibited.

4.6.2.10 The aircraft crew member or qualified operator in the cockpit must:

- connect and disconnect power to/from the aircraft on-board power supply;
- use the aircraft hydraulic system to pressurise the brake system;
- use the aircraft main and parking braking system on the commands of the towing team supervisor. Prior to the full stop, the use of the aircraft braking system is

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allowed only in cases of extreme necessity such as a threat of collision with an obstacle, aircraft disconnection from the tractor, breaking down of the tow bar, risk of the aircraft collision with the tractor as well as in other cases that may result in an emergency situation;


- turn aircraft lights on/off;
- ensure communication by radio or through intercom with the towing supervisor;
- if necessary, request the airport traffic controller for a towing permit/route;
- inform the towing supervisor of the readiness for towing;
- supervise operation of the aircraft systems during the towing process, perform necessary actions in the cockpit after the towing completion.

4.6.2.11 During aircraft towing, it is prohibited to:

- stay on the aircraft surface (wing, fuselage, engine);
- stay on the sides of the tractor body, get in or get out of the cabin or the tractor body;
- sit on the tow bar;
- adjust the tow bar's attachment to the aircraft or tractor while towing;
- push back the aircraft with the tow bar by the tractor in reverse motion;
- pull out the aircraft stuck in the ground with the help of a tow bar by the nose landing gear;
- stop the tractor if it is disconnected from the tow bar during towing (to avoid collision with the aircraft moving by inertia);
- stay in the path of the landing gear wheels.

ATTENTION!

When towing any aircraft with its engines running, make sure that the handling personnel and ground support equipment are at a safe distance and in safe areas to prevent engine damage and ensure safety.

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- 4.6.2.12 Strictly follow the safety rules when towing an aircraft. Make sure the aircraft path is clear of obstacles. Make sure there are no people sitting or standing on the tow bar.
- 4.6.2.13 While towing / taxiing (also at low speeds), all handling personnel and passengers must be seated and fastened with their seat belts. If the seat belt is not fastened, there is a risk of injury if the aircraft comes to an abrupt stop.
- 4.6.2.14 Do not tow the aircraft with the engine cowls open, it may cause damage to the cowls and nacelle components.
- 4.6.2.15 The aircraft must be stopped at the “stop” command of any towing team member noticing a hazard threatening the people and equipment.
- 4.6.2.16 It is prohibited to carry out any work on aircraft in lightning activity. All personnel must be inside the aircraft or premises. Lightning strikes are dangerous for the personnel.
- 4.6.2.17 The NLG control disengagement lever must be locked in the towing position before the tow bar or tractor is connected to the aircraft. Failure to do so may result in damage to the tow bar mount or control system components and bodily injury to the personnel.
- 4.6.2.18 Do not use the aircraft brakes until it comes to a full stop except in emergencies; the distance from the aircraft extremities to obstacles should be at least 2 meters; When moving near obstacles, the speed should be reduced to a minimum to avoid any damage to the aircraft.;
- 4.6.2.19 During towing, do not turn (do not hold) the nose landing gear steering bypass lever in the cockpit. This may cause damage to the steering system.
- 4.6.2.20 During the towing process, all personnel must stay outside danger areas less than 3 meters away from the tractor, tow bar, nose and main landing gear wheels to avoid bodily injury.
- 4.6.2.21 Do not engage the aircraft parking brake if the brakes are hot, this may cause brake seizure.
- 4.6.2.22 Keep a distance of at least 3 meters between the personnel and the tractor, tow bar, nose and main landing gear wheels when in motion.

4.6.3 Restrictions on aircraft towing.

4.6.3.1 When towing an aircraft, it is necessary to consider this aircraft overall dimensions. The dimensions of an aircraft with winglets:

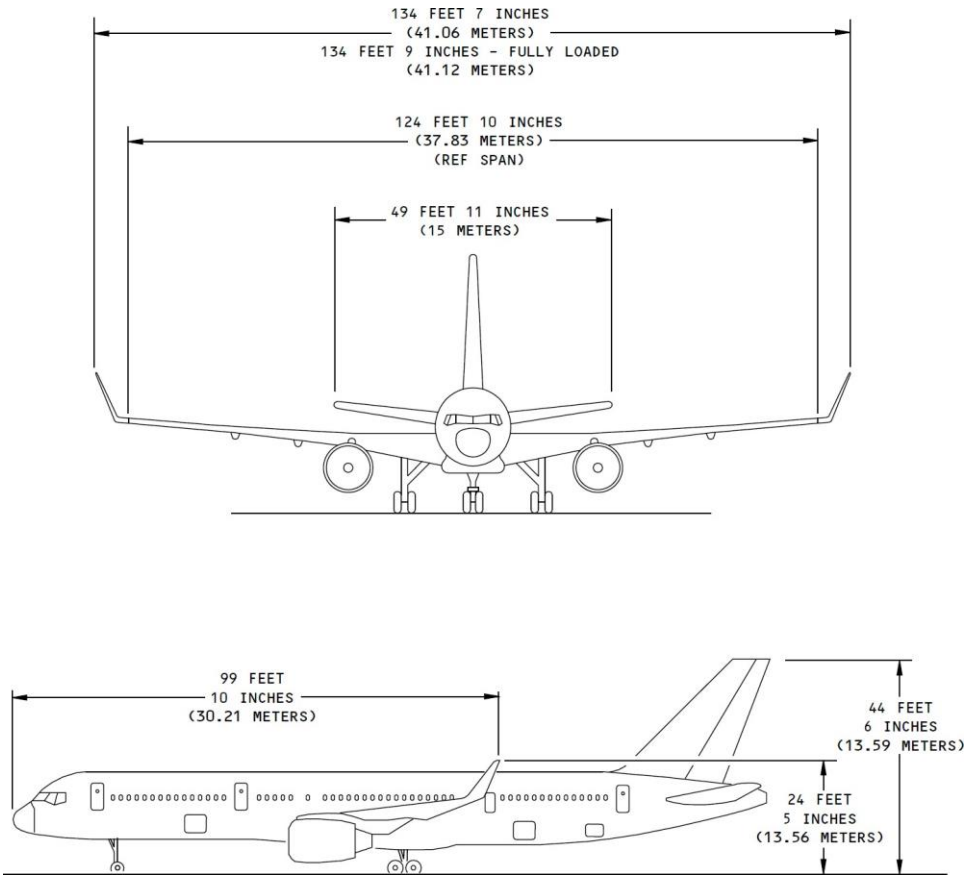
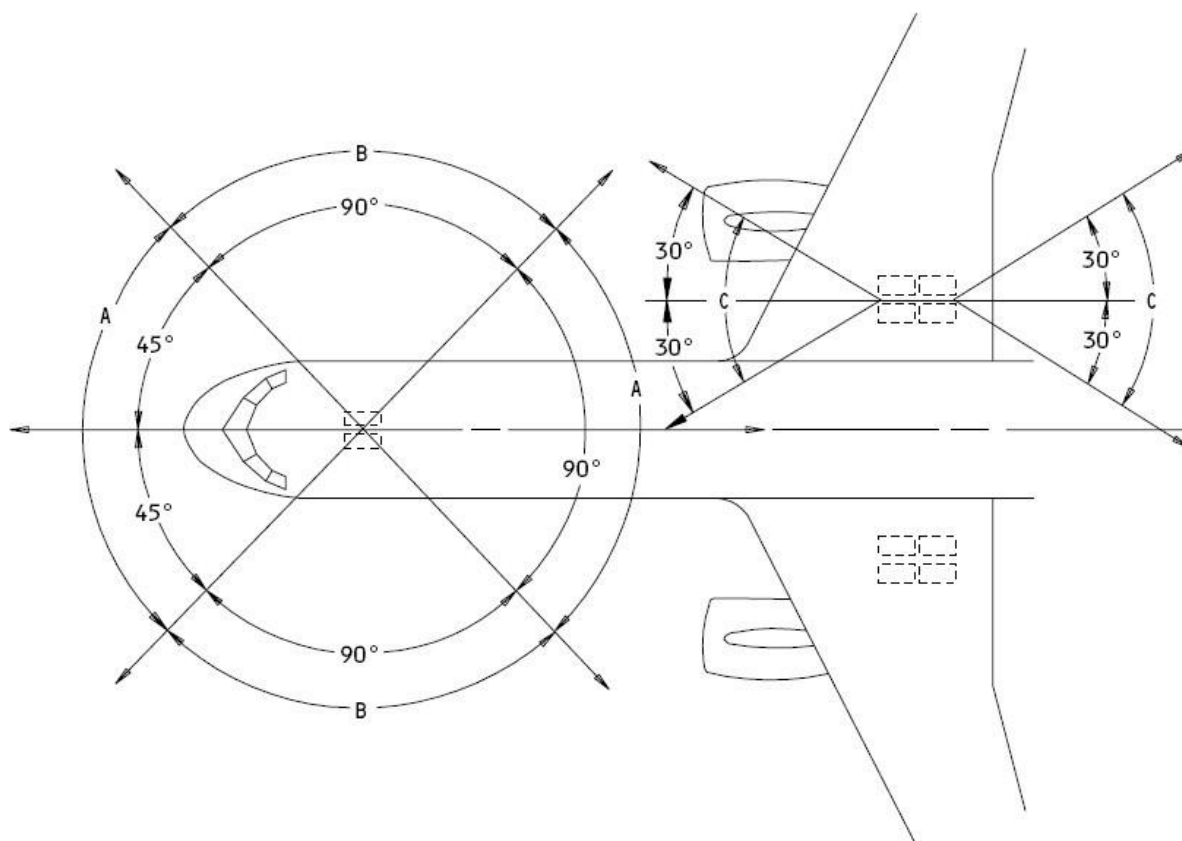


Figure 18. Dimensions of Boeing 757-200PCF aircraft

4.6.3.2 Do not exceed the maximum loads when towing (Figure 19);



A	36,200 LBS (16,420 Krc)
B	33,000 LBS (14,970 Krc)
C	24,560 LBS (11,140 Krc)

Figure 19. Maximum allowable loads on towing units depending on the angle of force application.

- 4.6.3.3 With the APU running, there should be a distance of at least 10 meters from the APU nozzle exit to the wingtips (fuel system drainage outlets) of the adjacent aircraft.
- 4.6.3.4 The maximum allowable towing speed of a Boeing 757 aircraft shall be determined by the airport authority depending on the local conditions. As a rule, towing along the apron and aircraft parking stands is carried out at a pedestrian speed. In the absence of obstacles (on taxiways and runways) the speed may be increased, but no more than allowed by the airport authority.
- 4.6.3.5 If it is necessary to tow, make sure that the aircraft centre of gravity is ahead of the aircraft centre of gravity limit value (see the Figure below). The limit value provides a margin for safe aircraft towing on a slope, in high winds and with acceleration.

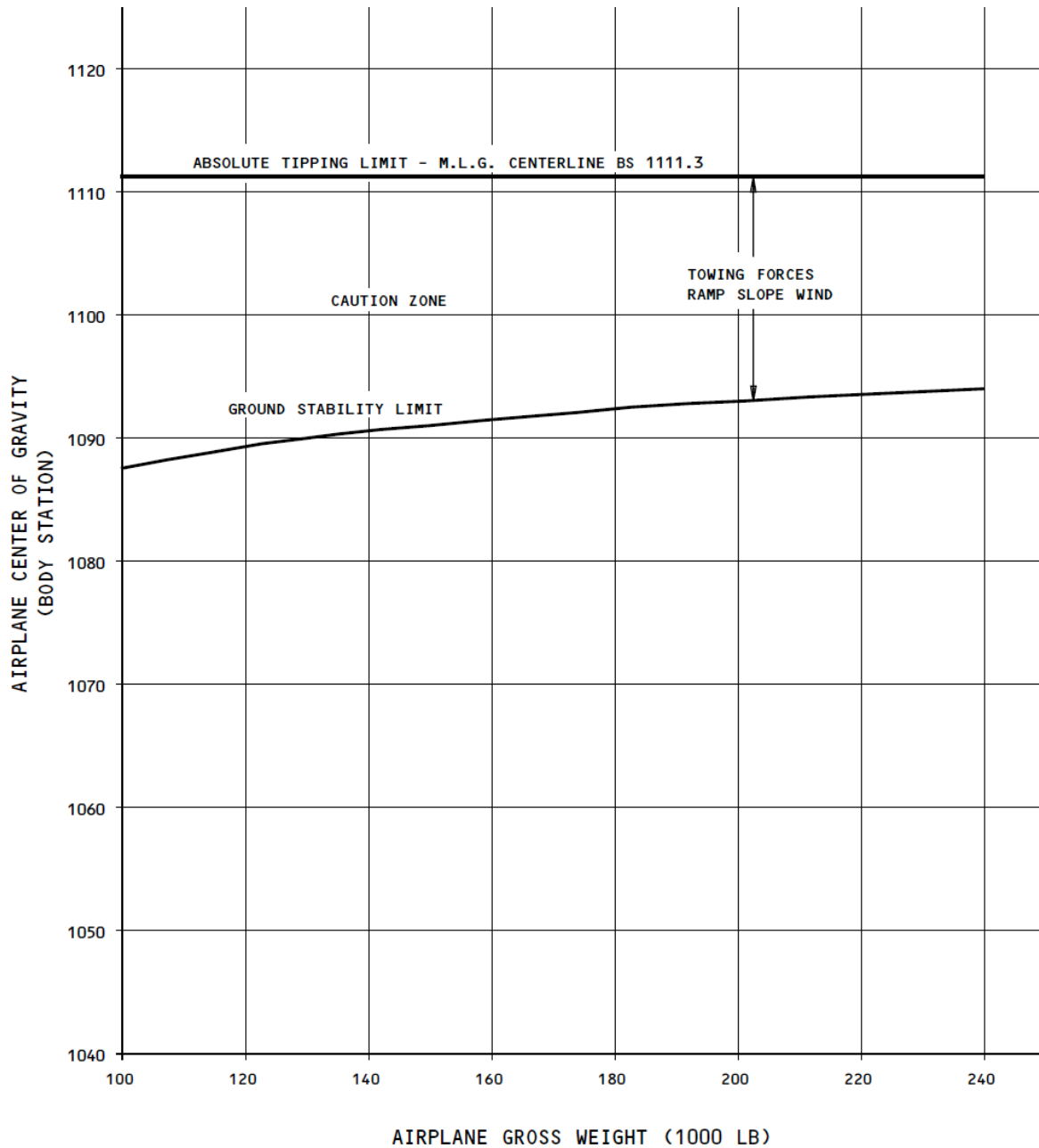


Figure 20. Graph of the aircraft centre of gravity values.

4.6.4 Preparation of aircraft for towing.

4.6.4.1 Equipment:

- a tow bar for Boeing-757 aircraft;
- a steering bypass pin, NLG towing - A09003-1 (or equivalent).

4.6.4.2 Preparation work for towing:

- close the reverser and engine fan stage cowls (make sure they are closed);

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- close the baggage compartment doors, entrance and service doors, technical compartment doors (make sure they are closed);
- install the steering bypass pin in the locking device on the nose landing gear to disengage the wheel steering system. (Figure 21)

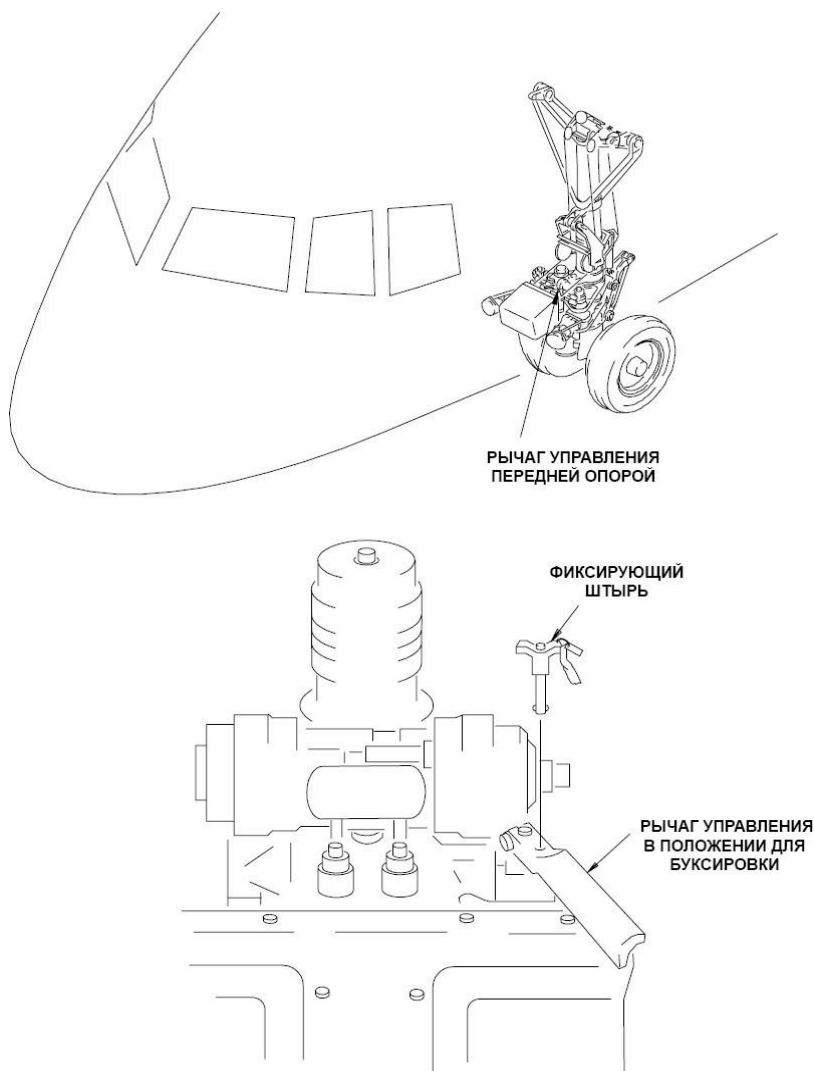


Figure 21. Installation of a steering bypass pin on the NLG steering bypass lever.

4.6.4.3 It is allowed to rotate the nose landing gear up to an angle of 65 degrees to each side without disconnecting the torque link.

Note. The red line on the nose landing gear doors indicates a 65-degree deflection angle. Disengage the nose landing gear torque link if you need to rotate for more than 65 degrees to avoid damage to the nose landing gear control system.

Note. In emergencies, it is allowed to tow aircraft without disengaging the wheel steering system if the following conditions are met:

- the crew has been informed and has agreed;
- the electro-hydraulic pumps remain switched off until the completion of towing;
- engines are started after the completion of towing;

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- no pre-flight and technical checks are performed during towing to prevent the electric pump of the emergency hydraulic system from turning on.

4.6.4.4 Make sure that the landing gear wheels are not flat and the landing gear pistons are not fully compressed.

4.6.4.5 Make sure that the extension is at least 2 inches (51 mm) as shown in Figure 22:

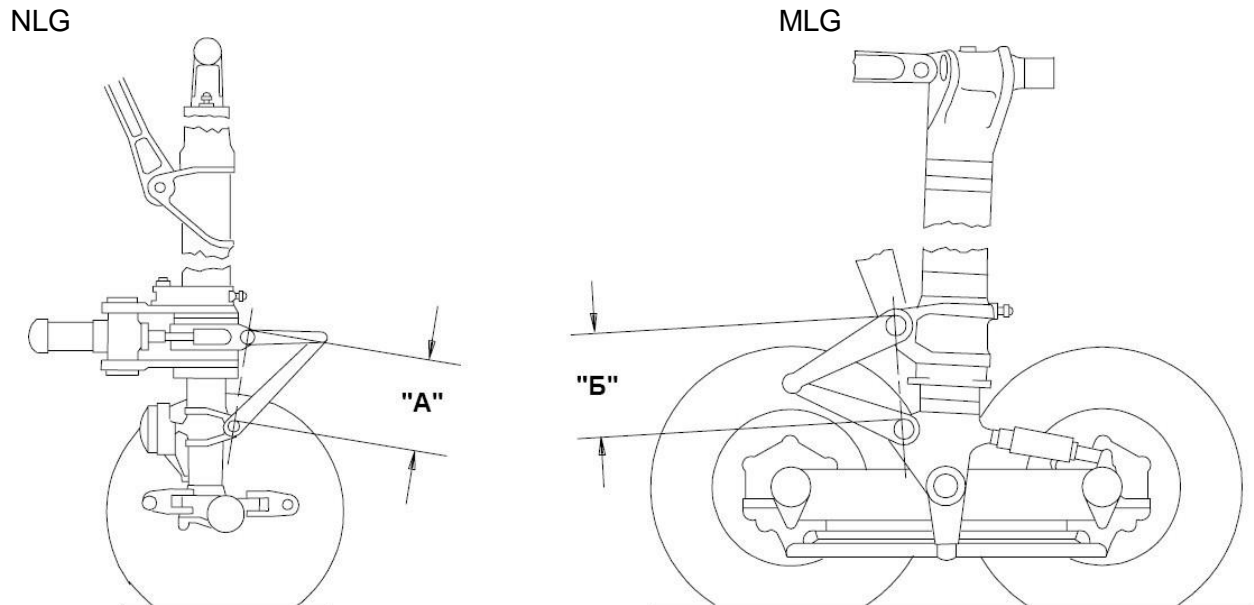


Figure 22. Nose and main landing gear, extension measurement.

- size «A»: at least 291 mm (240 mm with fully compressed shock absorber);
- size «B»: at least 367 mm (316 mm with fully compressed shock absorber);

4.6.4.6 Visible mirror (low load on the nose landing gear) can be evidence of excessive rear balance, which can lead to the aircraft tipping backwards.

ATTENTION!

Do not tow an aircraft with the landing gear shock absorbers fully compressed. In case of emergency, it is allowed to tow with fully compressed shock absorbers. In this case a maximum speed of 8 km/h is allowed. With fully compressed shock absorbers, tow only forward at minimum steering angles.

4.6.4.7 Pressurize the right hydraulic system (use the ground power unit or APU generator) or the central hydraulic system if the right hydraulic system is unavailable.

4.6.4.8 Make sure that the pressure in the brake system hydraulic accumulator is in the normal range, about 3000 psi.

ATTENTION!

The 2800 psi pressure in the brake system hydraulic accumulator provides from two to three brake applications.

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- 4.6.4.9 Install the pins on the landing gears (only for towing an empty aircraft along the apron).
- 4.6.4.10 Make sure there is no imbalance over 454 kg (1,000 lbs) between the left and right fuel tanks, if necessary, transfer the fuel in accordance with the operation manual.
- 4.6.4.11 Establish two-way communication with the aircraft crew or aircraft technician in the cockpit. The aircraft technician must have clearance to work in the cockpit of this type of aircraft.
- 4.6.4.12 Connect the tow bar to the aircraft nose landing gear, and then – to the tractor.
- 4.6.4.13 Remove aircraft grounding.
- 4.6.4.14 Make sure the ground support equipment has been removed and does not interfere with the towing operation.
- 4.6.5 Aircraft towing.
- 4.6.5.1 Remove the wheel chocks.
- 4.6.5.2 Make sure there is two-way communication between the cockpit, towing supervisor and the tractor driver.
- 4.6.5.3 Make sure the parking brake is off and start towing the aircraft.

Note. There is a parking brake indication on the rear side of the nose landing gear. When the parking brake is engaged, the light on the P40 panel is on (power supplied by the battery).

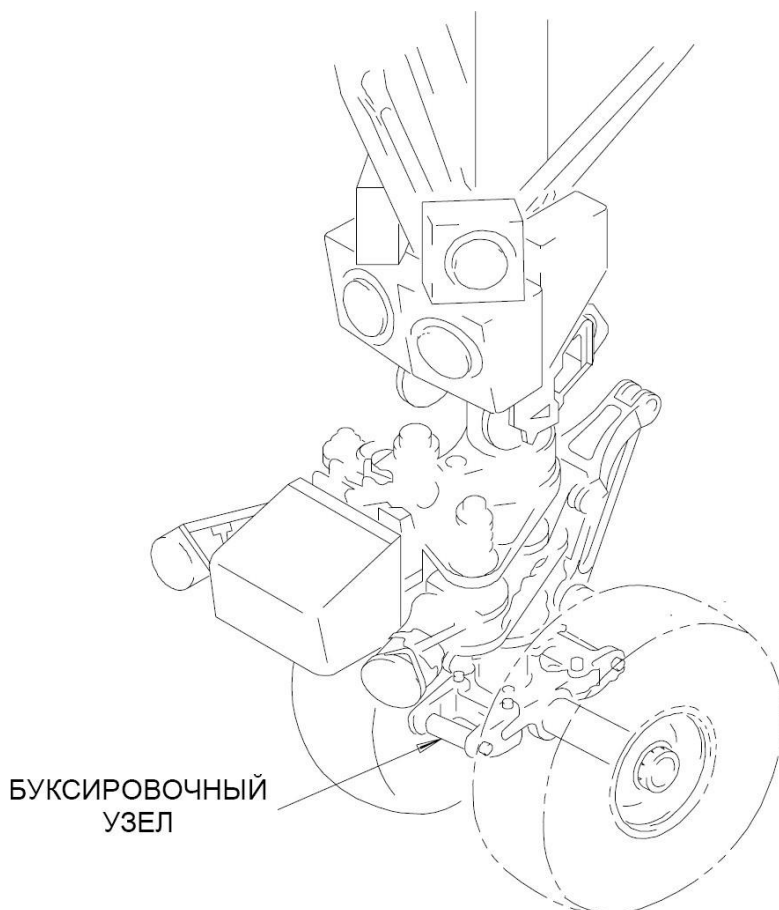



Figure 23. Nose landing gear towing point.

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4.6.5.4 Be extremely careful when standing near the aircraft being towed (see the towed aircraft danger area chart).

4.6.5.5 Start towing from a straight line before you start steering the aircraft.

4.6.5.6 The use of aircraft brakes should be minimal for safety reasons.

Note. A fully charged battery is sufficient for six compressions.

4.6.5.7 The maximum steering radius of the nose wheels during towing - 65° - is marked with a red stripe on the front doors of the nose landing gear. Do not exceed this angle.

Note. If a larger steering angle is required, it is necessary to disconnect the nose landing gear torque link.

4.6.5.8 When completing the towing operation, the last five (5) meters should be performed in a straight line to relieve the landing gear from the turning moments. The nose landing gear wheels must be in the neutral position before stopping.

4.6.5.9 Engage the parking brake.

4.6.5.10 Install two chocks under each landing gear about 2 to 4 inches (50 to 100 mm) from the wheels (if necessary).

4.6.5.11 Disengage the parking brake.

4.6.5.12 Disconnect the tow bar from the tractor and then – from the aircraft.

4.6.5.13 Remove the steering bypass pin from the locking device on the nose landing gear to engage the wheel steering system.

ATTENTION!

When removing the steering bypass pin, stand away from the nose landing gear wheels to avoid injury from accidental turning of the wheels.

4.6.5.14 Do not use the aircraft brakes until it comes to a complete stop except in an emergency; the distance from the aircraft extremities to obstacles should be at least 2 meters; When moving near obstacles, the speed should be reduced to a minimum to avoid damage to the aircraft.

4.6.5.15 During towing, do not turn (do not hold) the nose landing gear steering bypass lever in the cockpit. This may cause damage to the control system.

4.6.5.16 During the towing process, all personnel must stay outside danger areas less than 3 meters away from the tractor, tow bar, nose and main landing gear wheels to avoid bodily injury.

4.6.5.17 Do not engage the aircraft parking brake if the brakes are hot, it may cause brake seizure.

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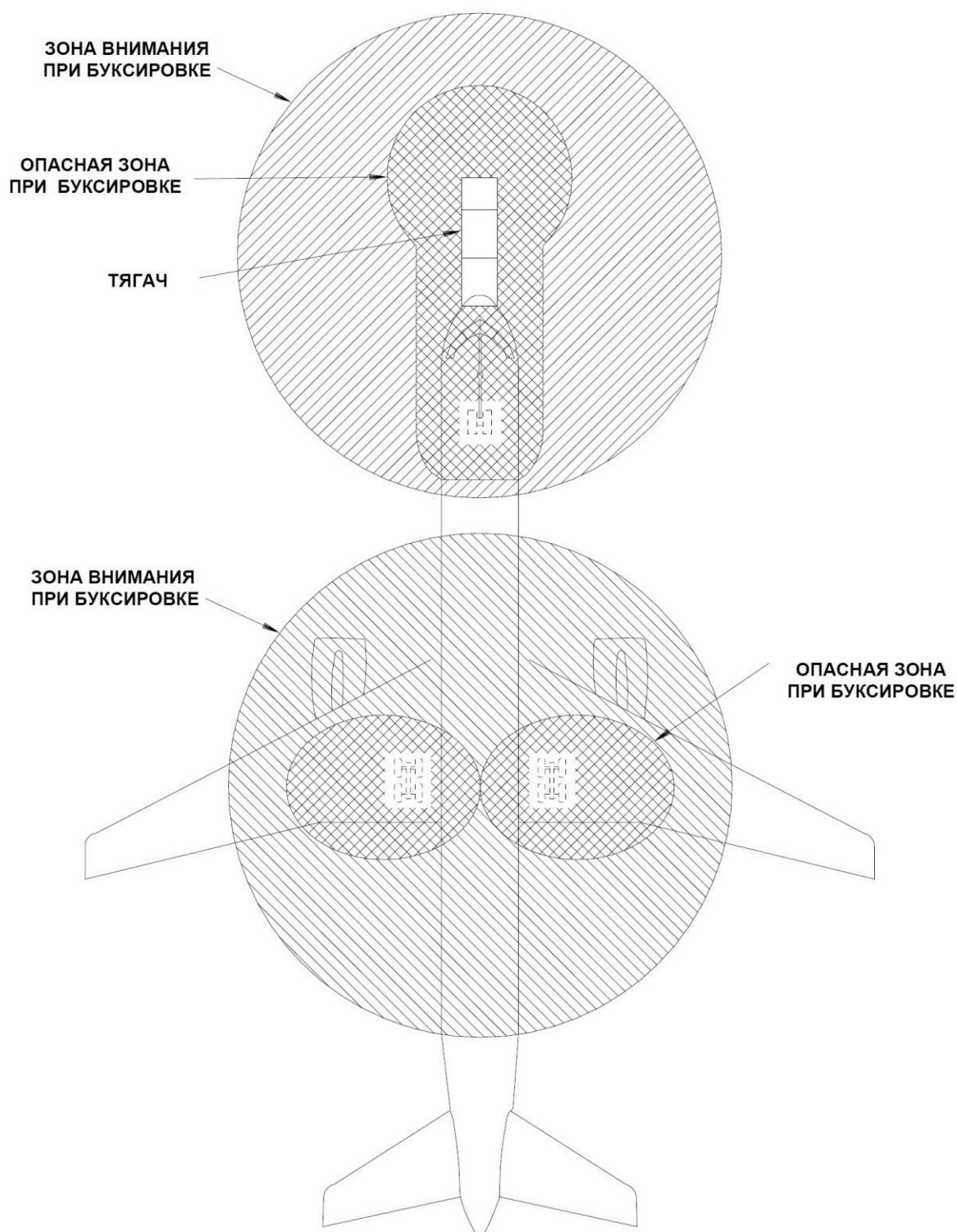


Figure 24. Danger areas when towing

ATTENTION!

Keep a distance of at least 3 meters between the personnel and the tractor, tow bar, nose and main landing gear wheels while moving.

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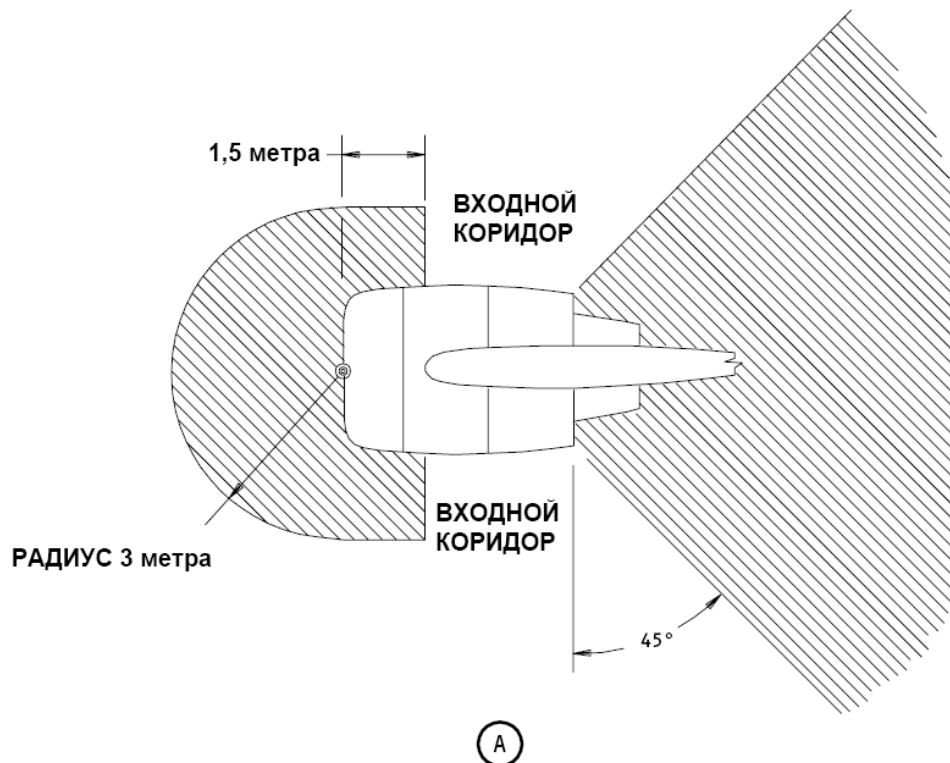
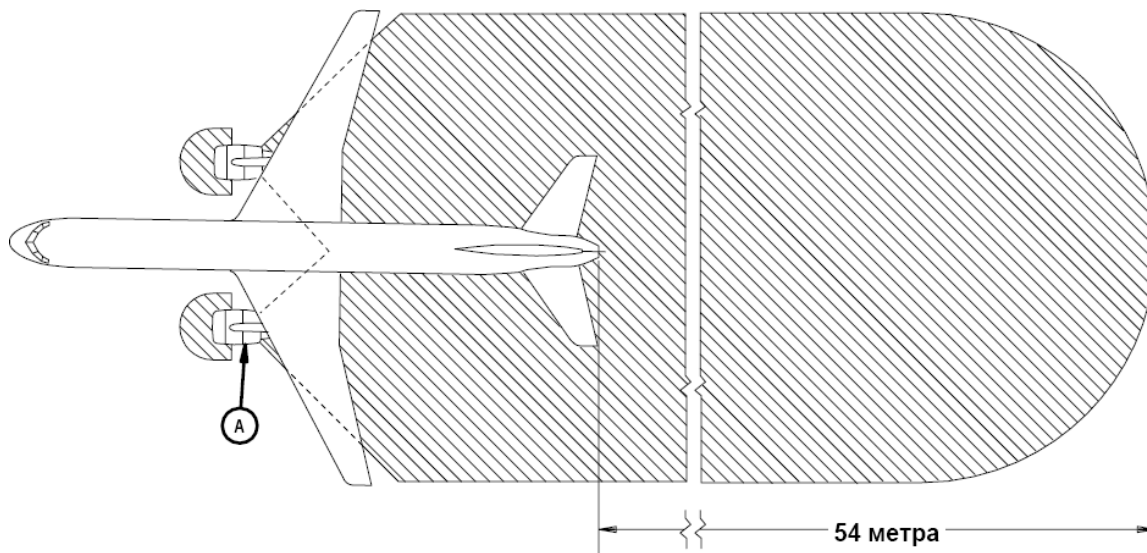


Figure 25. Danger areas with the engines running at idle.

4.6.6 Aircraft towing in heavy winds.

4.6.6.1 Allowable wind velocity for towing an empty aircraft:

- 20 m/s at a tire-to-ground friction coefficient of 0.6 (dry surface);
- 15 m/s at a tire-to-ground friction coefficient of 0,3 (wet surface);
- 10 m/s at a tire-to-ground friction coefficient of 0,15 (frozen surface).

4.6.6.2 Allowable wind velocity for towing a loaded aircraft:

- 25 m/s at a tire-to-ground friction coefficient of 0,5 (dry surface);
- 20 m/s at a tire-to-ground friction coefficient of 0,3 (wet surface);
- 15 m/s at a tire-to-ground friction coefficient of 0,15 (frozen surface).

Note. for these conditions, the flaps must be set to “0” and the stabilizer must be set to “3”.

4.6.6.3 Disengage the wheel steering system after connecting the tow bar.

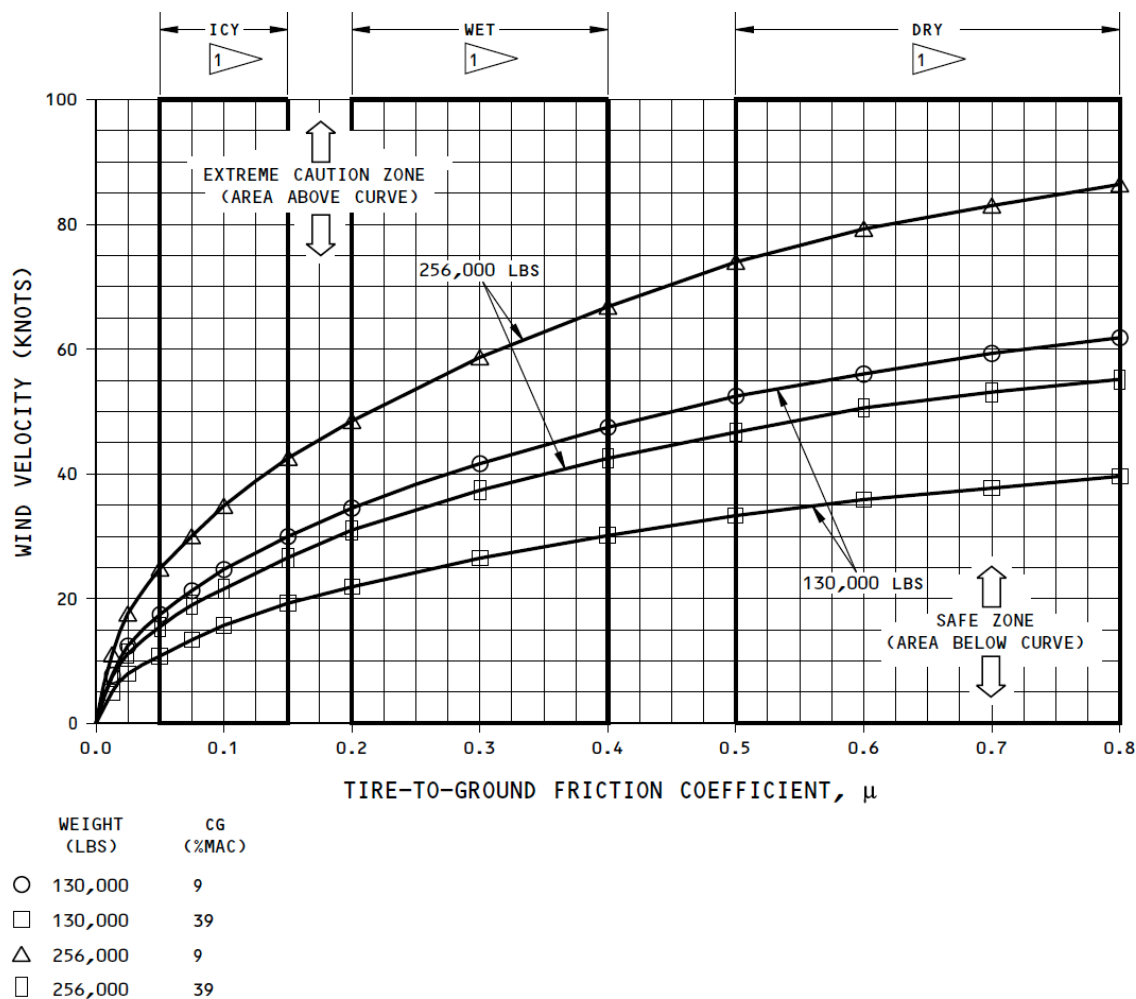



Figure 26. Determining the tire-to-ground friction coefficient.

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4.6.7 Towing of aircraft with flat tires.

4.6.7.1 It is allowed to tow aircraft by the nose landing gear with one flat NLG tire and five flat MLG tires only to remove the aircraft from the runway. In case of six flat MLG tires, towing is only permitted with a soft towing unit connected to the MLG.


4.6.7.2 Towing speed should be minimum.


4.6.7.3 Avoid large steering angles of the nose landing gear when towing.

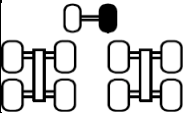
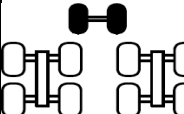
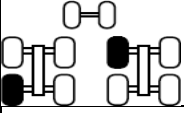
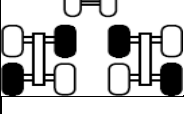
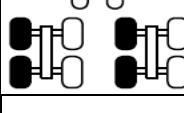
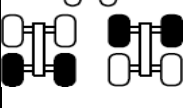
4.6.7.4 After towing the aircraft with two flat tires on one axle, special works on the landing gear are to be performed.


Note. It is not recommended to tow an aircraft with four flat tires on one landing gear when the landing gear beam is on the ground. The towing force will be such that it will cause damage to the landing gear. It is only allowed for removal from the runway if it is necessary to clear the runway in case of an emergency.

Note. It is recommended that flat tires be replaced before towing.

 GIVES LOCATION OF INFLATED TIRE

 GIVES LOCATION OF FLAT TIRE

	CONDITION	POSITION OF FLAT TIRE(S)	RESTRICTIONS
1	One flat NLG tire		NO* DO NOT USE TOWBARLESS TOWING
2	Two flat NLG tires		Only to remove the aircraft from the runway. Then at least one serviceable tire shall be installed.
3	One flat tire of one or both MLG.		NO
4	Two diagonally flat tires on one or both MLG		NO
5	Two tandem flat tires on one or both MLG		NO
6	Two flat tires on one axle on one or both MLG		Only to remove the aircraft from the runway. Then replace the tires or change them to the model of paragraph 4

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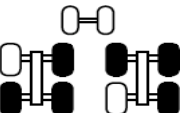
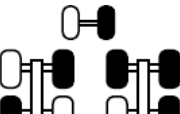
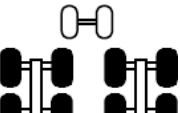
7	Three flat tires on one or both MLG		Only to remove the aircraft from the runway. Then replace the tires or change them to the model of paragraph 4
8	One flat NLG tire and five flat MLG tires in any position		Only to remove the aircraft from the runway. Then replace the tires or change them to the model of paragraph 4
9	Four flat tires on one or both MLG		Only to remove the aircraft from the runway. Then replace the tires or change them to the model of paragraph 4

Figure 27. Towing aircraft with flat tires.

4.6.8 Additional instructions for filling and draining B757-200PCF aircraft potable water system.

4.6.8.1 Water draining procedure:

- disengage the WATER HEATER fuse on panel P11-4;
- open the cabinet under the sink;
- turn the drain valve handle under the sink to the OPEN position;
- water should start to drain from the front drain line;
- when the tank is empty, turn the drain valve handle under the sink to the CLOSED position.

4.6.8.2 Water filling procedure:


ATTENTION!

In winter, make sure the temperature in the cockpit has been above 5°C for 30 minutes.

- provide access to the potable service water panel;
- open the cap on the water fill connection;
- connect the water supply hose to the water fill connection;
- turn the water tank fill valve handle to the OPEN position;
- fill the potable water tank with water until water flows from the overflow port on the service panel;


Note. potable water tank capacity is 3 gallons (11.3 liters)

- stop supplying water to the tank;
- turn the water tank fill valve handle to the CLOSED position;
- disconnect the water supply hose from the water fill connection and allow it to drain to the fill line;
- close the cap on the water fill connection;
- close the potable water service panel door;


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4.6.9 Specific features of B757-200PCF aircraft refuelling

- 4.6.9.1 General precautions for refuelling and defueling must be observed.
- 4.6.9.2 Before starting the refuelling/defueling operation, make sure that all electrical circuits related to the fuel system are serviceable.
- 4.6.9.3 Aircraft must be refuelled in the area provided with free air movement, fire and other emergency alert.
- 4.6.9.4 Refuelling must be stopped under all circumstances if the safety of people or equipment is not ensured.
- 4.6.9.5 The incidence of fuel spills varies. The spill size, weather conditions, equipment location, aircraft loading, emergency equipment, and available personnel may predetermine the fire localization.
- 4.6.9.6 During the refuelling, keep monitoring the process at all times to prevent fuel spills.
- 4.6.9.7 In case of a fuel spill, it is necessary to immediately:
 - stop the refuelling process;
 - notify everyone on board the aircraft;
 - shut down the APU through the regular shutdown procedure;
 - detect and eliminate the cause of the fuel spill;
 - check the aircraft enclosed areas for absence of fuel vapours;
 - do not start refuelling until allowed to do so from the employee responsible for fire safety.
- 4.6.9.8 Refuelling with passengers (cargo accompanying persons) on board may be done subject to the airport and aircraft operator procedures developed therefor. During such refuelling, danger area must be defined and fenced to prevent passengers from entering.
- 4.6.9.9 The following operations must be prohibited during aircraft refuelling:
 - any operations involving SW radio communication;
 - connection/disconnection of the battery charger, ground power unit;
 - filling of oxygen tanks;
 - power outage.

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- 4.6.9.10 Do not start refuelling if a fire alarm or engine overheat alarm has been activated in the cockpit.
- 4.6.9.11 Do not start refuelling if any landing gear component is abnormally overheated.
- 4.6.9.12 In exceptional cases it is allowed to refuel with the main engine running as the power source. The operation procedure for this case is provided by the airport and the aircraft operator.
- 4.6.9.13 Do not position any equipment under the aircraft. During the refuelling operation, the wingtips are lower than the rest of the wing. During the refuelling operation, the air from the fuel tanks escapes through the drain holes on the underside of the wing closer to the wingtips and the concentration of fuel vapours is higher there.
- 4.6.9.14 Do not switch on the electrohydraulic stations of hydraulic systems A and B with less than 800 kg fuel in each wing tank. Do not switch on the additional electrohydraulic station with tank No. 2 empty.
- 4.6.9.15 Do not disengage the emergency shutdown of the fuelling panel. The disengaged emergency shutdown can cause a fuel spill.
- 4.6.9.16 When positioning the fuel truck at the aircraft, it is necessary to make sure that:
- the fuel truck departure path must be clear for the entire period of refuelling;
 - the fuel truck does not block access to the aircraft in case of an accident or fire;
 - the fuel truck does not block the path of passengers in case of an accident;
 - the fuel truck does not block the emergency escape slide door areas.
- 4.6.9.17 Aircraft refuelling should be done only in the area permitted by the airport. The fire-fighting equipment, emergency equipment, fire extinguishers of the prescribed form must be available in this area.
- 4.6.9.18 The following requirements must be met in the aircraft refuelling area:
- only authorized personnel and vehicles may be in the area;
 - all personnel shall be aware that the fuel truck is at the aircraft and the refuelling is in progress;
 - technical operations are limited to prevent accidental sparking and ignition of fuel vapours;
 - all ground electrical equipment must be designed to work in the danger area;
 - it is prohibited to allow running vehicle engines in the area, except for vehicles servicing the aircraft;
 - it is prohibited to use metal wheels and studded tires;
 - it is prohibited to allow open flame, heaters, flammable material, shoes with metal brackets, horseshoes and other potential spark generating sources less than 15 meters from the aircraft.
- 4.6.9.19 In case of thunderstorms within a radius of 16 km, it is necessary:
- to notify the crew, airport responsible officer/departure coordinator, or air traffic manager to decide on proceeding with the refuelling;
 - to stop refuelling if it is suspended;
 - to remove and disconnect the aircraft headsets from the external outlets;
 - not to touch any electrical connectors/connections.

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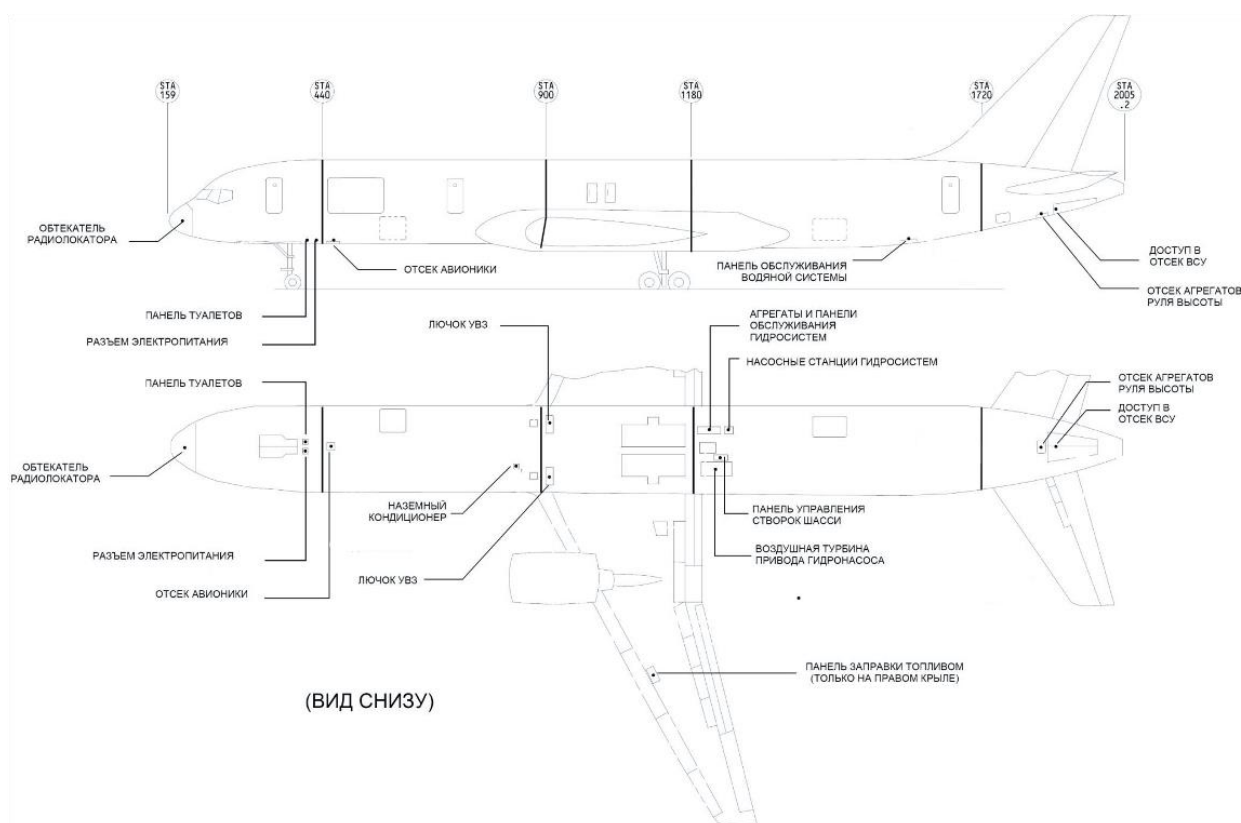


Figure 29. Location of aircraft servicing points

4.6.9.20 Among Russian fuels, it is allowed to use the fuels that meet All-Union State Standard (GOST) 10227, namely RT and TS-1 (Aircraft Maintenance Manual - 757). It is also allowed to use the fuel system icing inhibitors:

- GOST 8313 known as “I-Liquid”, no more than 0.15% of the volume
- TU-6-10-1458, known as “I-M Liquid”, no more than 0.15% of the volume (see AMM - Boeing - 75712-33-02/ page 303 item 4)

4.6.9.21 To refuel the aircraft, the AC (APU or ground power unit) or DC (aircraft battery) power supply is required.

4.6.9.22 Before allowing a fuel truck to approach the aircraft, it is necessary to make sure that:

- the weather radar in the cockpit is off;
- the wheel chocks have been installed;
- the parking stand is equipped with serviceable firefighting equipment.

4.6.9.23 The fuel truck is adjusted to the aircraft with a minimum number of manoeuvres and positioned so as to ensure immediate departure from the aircraft in case of danger.

ATTENTION!

When refuelling the aircraft, it is forbidden to place stepladders and other ground support equipment under the fuselage and wing in close proximity to the aircraft skin, as the aircraft may lower during the refuelling process. In this case the wing tips may lower the most under the weight of the fuel, and since the fuel tanks are ventilated through the drain tanks located at the wing tips, an explosive concentration of fuel vapours may accumulate in these areas.

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ATTENTION!

When refuelling the aircraft, it is strictly forbidden to operate an SW radio or a weather radar. Doing so may cause a fire or fuel explosion.

4.6.9.24 Before connecting the fuel hose to the aircraft, it is necessary to make sure that:

- the aircraft and the fuel truck are connected with each other by the grounding cable. The grounding receptacle is at the main landing gears;
- the aircraft and the fuel truck are grounded;
- the grounding stud (if any) of the fuel hose is inserted in the grounding receptacle on the wing near the filling port;
- the maximum fuel pressure when filling shall be 55 psi (3.85 atm).

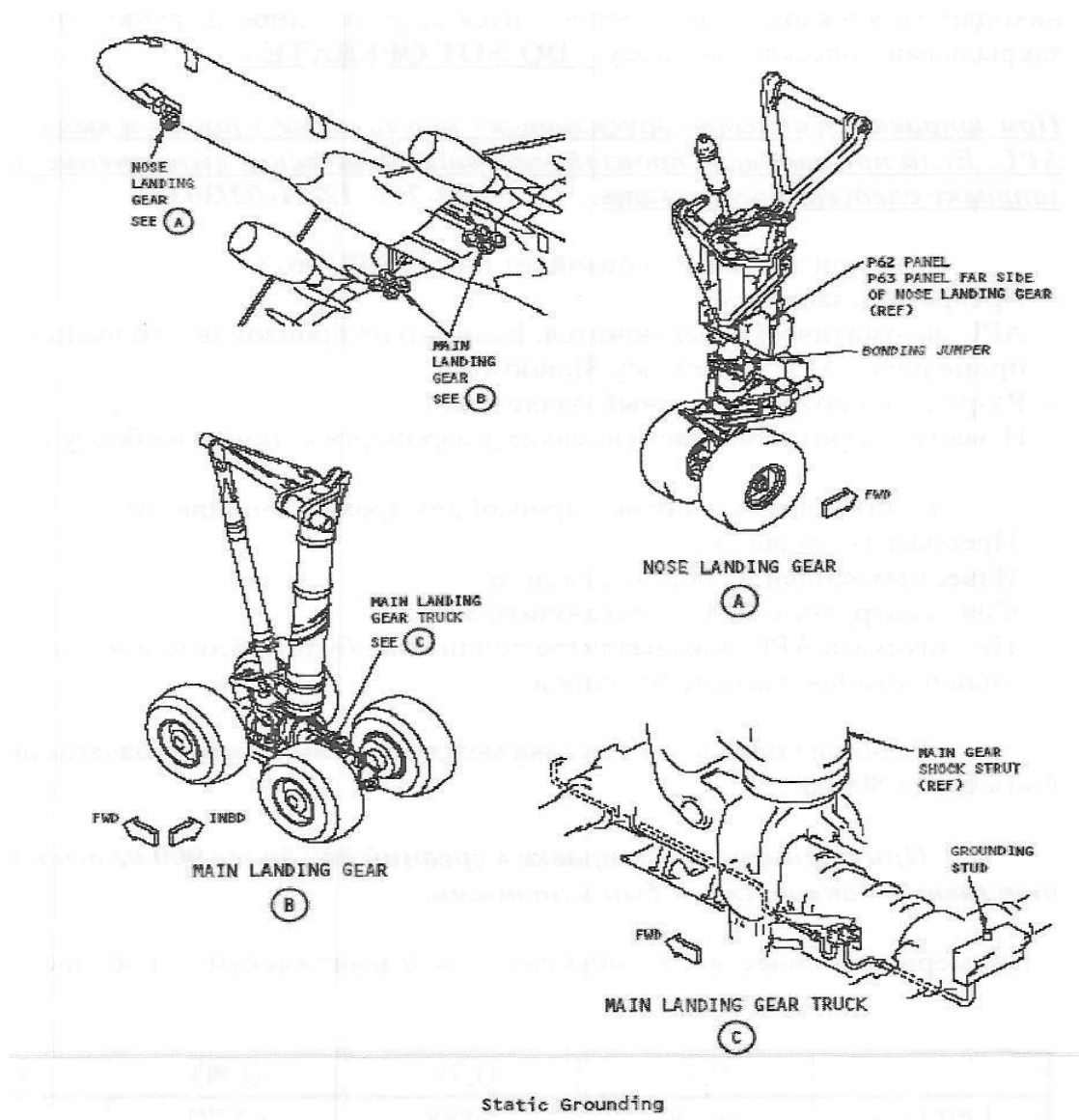



Figure 30. Aircraft grounding points

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4.6.9.25 When refuelling the aircraft, do not extend (do not retract) the high-lift devices, as this may cause damage to the aircraft and injury to persons. Warn cabin occupants that refuelling is in progress or place the “DO NOT OPERATE” plate on the flap control handle.

4.6.9.26 When refuelling the aircraft, the (regular) start-up and shutdown of the APU are allowed. If any automatic APU shutdown occurs during the refuelling process, such refuelling should be terminated. (AMM-757 12-11-02/303).

4.6.9.27 In case of an APU fire during the refuelling process:

- it is necessary to stop the refuelling;
- the APU will be shutdown automatically.

4.6.9.28 If the APU is not shutdown automatically, the following procedure should be implemented:

- APU Emergency Shutdown;
- discharge the APU fire-extinguisher bottle;
- notify the airport fire-fighting service and people on board.

4.6.9.29 In case of a fuel spill during the refuelling process, it is necessary:

- to stop the refuelling;
- to notify the people on board;
- to unload the APU and shut it down;
- not to start the APU until the spilled fuel is removed and there is no danger of vapor ignition.

4.6.9.30 The difference in fuel quantity between the right and left tanks must not exceed 800 kg.

4.6.9.31 In case of planned refuelling of more than 900 kg in the centre tank, the wing fuel tanks must be full.

The approximate quantity of fuel by tank (kg):

Left tank	7200
Center tank	22597
Right tank	7200
Total	36997

4.6.10 Description of the B757-200PCF aircraft fuelling station.

4.6.10.1 The fuelling station is located on the lower front surface of the right half-wing on the outer side from the engine. It allows for pressurized refuelling of aircraft, defueling, and transfer of fuel from one tank to another. Upon opening the fuelling station door, the fuelling panel and all units of the system are automatically powered by 28v DC.

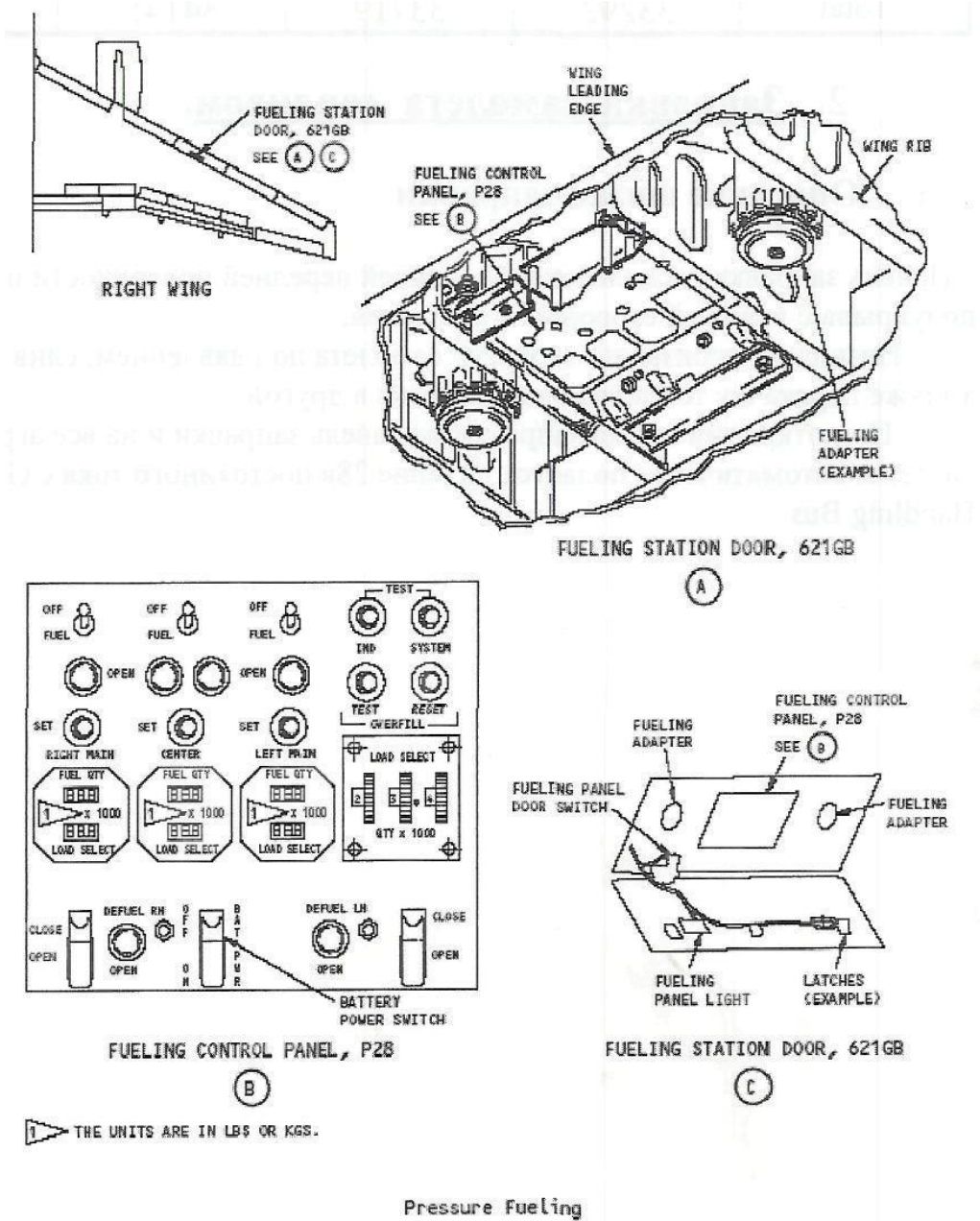


Figure 31. Aircraft fuelling station.

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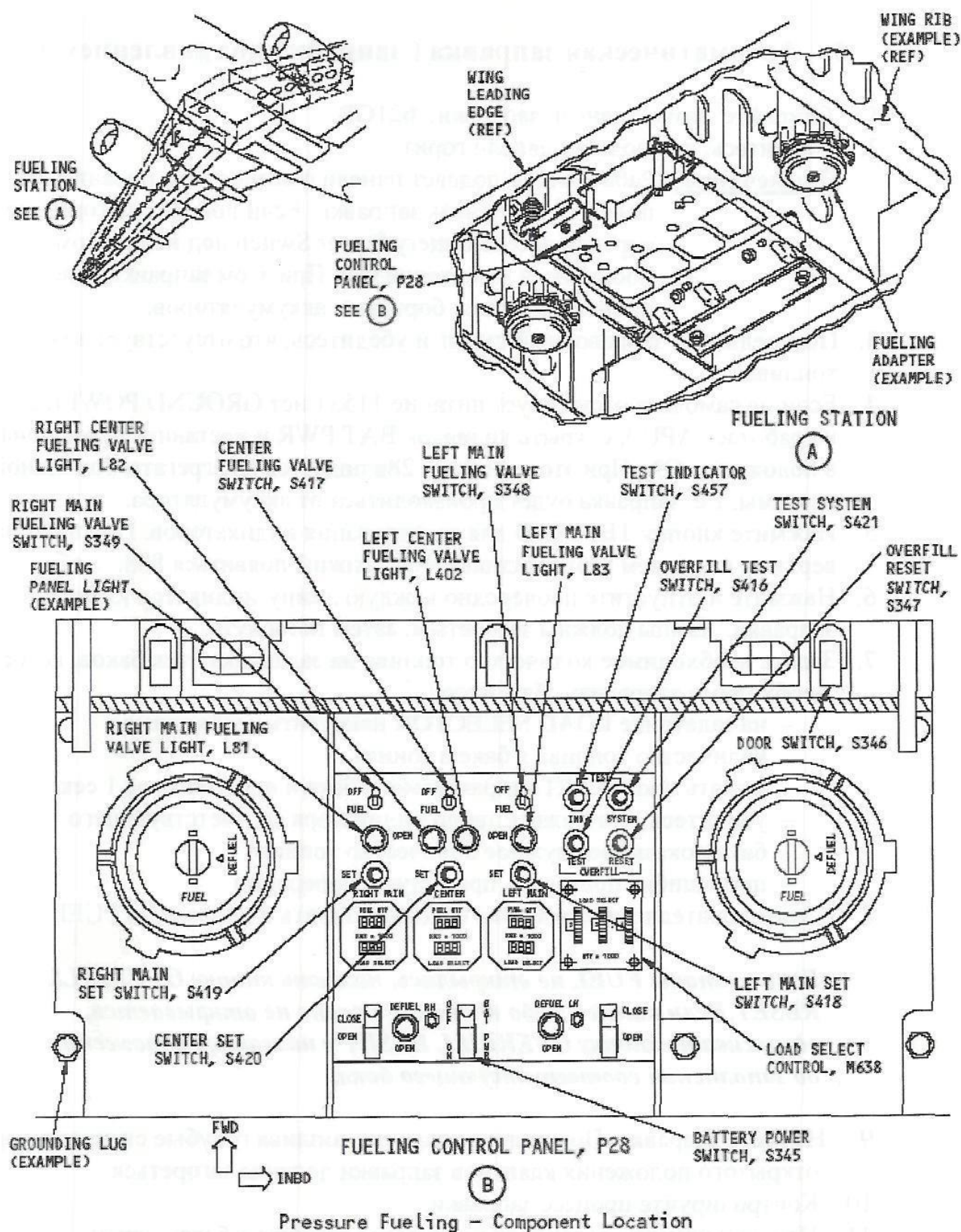



Figure 32. Aircraft fuelling station.

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4.6.11 Automatic refuelling of B757-200PCF aircraft:

4.6.11.1 Open the fuelling panel door, 621GB.

4.6.11.2 Make sure that the panel light is on.

Note. A working panel light means that 28v power is being supplied to the fuelling panel. If the panel light is off, set the Battery Power Switch under the cap to the ON position. In this case refuelling will be carried out using the aircraft batteries.

4.6.11.3 Connect the fuelling hose and make sure in the absence of fuel leaks.

4.6.11.4 If there is no 115v power on the aircraft (no GROUND POWER and the APU is not running), open the BAT PWR cap and set the switch to the ON position. This will supply 28v power to the fuel system units, i.e., refuelling will be done using the battery.

4.6.11.5 Press the TEST IND button to test the indicators. Herewith, "888" should appear on the upper and lower indicator panels.

4.6.11.6 Press and release each fuelling valve indicator lamp in turn. The lamps should light up and then go out.

4.6.11.7 Set the required quantity of fuel on the selectors of the tanks to be refuelled. To do this:

- on the LOAD SELECTOR, set the required quantity of fuel in the tank in tons;
- press the SET button of the tank to be refuelled and hold it for 1 second;
- make sure that the lower display of the corresponding tank indicator shows the correct quantity of fuel;
- in case of an error, repeat the previous operations.

4.6.11.8 Set the fuel tank switches to the FUEL position.

Note. If the FUEL valves have not opened, press the OVERFILL RESET button. If any valve still does not open, keep the OVERFILL RESET button pressed until the corresponding tank is filled.

4.6.11.9 Start refuelling. With fuel pressure applied, the blue indicator lamps of the fuelling valves open position should light up.

4.6.11.10 Monitor the refuelling process.

4.6.11.11 When the set quantity of fuel in the tanks is reached, the tank fuelling valves must close. After that (and also if they have not closed due to the automatics failure) set the fuelling valve switches to the OFF position.

4.6.11.12 Make sure that the fuelling valve open position indicators are off.


4.6.11.13 Command to disconnect the fuelling hose.

4.6.11.14 Command to remove the grounding.

4.6.11.15 When using the batteries as a DC power source for refuelling, set the BATTERY POWER SWITCH to the OFF position and close the cap.

4.6.11.16 Close the 621 GB refuelling panel door (all switches are automatically reset when the door is closed).

4.6.11.17 In the cockpit, remove the DO NOT OPERATE plate from the flap control handle (if any).

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4.6.12 Manual refuelling of B757-200PCF aircraft

4.6.12.1 Manual refuelling is used in case of a fuel automatic system malfunction. The actions for manual refuelling are the same as for automatic refuelling, except for:


- the wing tanks are refuelled first, the remaining fuel is refuelled in the centre tank;
- the tank fuelling valves are operated manually.

4.6.12.2 In case of manual refuelling, it should not be allowed to refuel over 6500 kg in the wing tanks, because the safety automatics may fail.

4.6.12.3 Do not allow over 800 kg difference in fuel quantity between the wing tanks. The approximate maximum quantity of fuel in the tanks (in kg) is given in Table 3.

Left tank	7200
Center tank	22597
Right tank	7200
Total	36997

Table 3.

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4.6.13 Refuelling of B757-200PCF with a fuelling nozzle through the fuelling ports on the upper wing surface (Fuel tank overwing fuelling)

- 4.6.13.1 Only the wing tanks can be refuelled by using this method. Herewith, the maximum charge will be less (approximately 5800 kg) than in case of pressurized refuelling. The centre tank can only be refuelled by transfer from the wing tank. There is one fuelling port on each half-wing. The refuelling speed should not exceed 100 US GALL/min (3,780 L/min)
- 4.6.13.2 It is possible to reach the wing either through the emergency exit from the cabin or by climbing the stepladder through the end of the wing. In doing so, it is necessary to take precautions so as not to fall off the wing. Do not step on the areas marked DO NOT STAND.
- 4.6.13.3 Before opening the port cap, insert the grounding stud (if available) of the refuelling hose into the grounding receptacle on the wing. Touch the metal part of the wing with the fuelling nozzle at least 0.5 m away from the port.
- 4.6.13.4 Open the fuelling (fill) port and insert the fuelling nozzle (Figure 34)
- 4.6.13.5 Open the 621GB refuelling panel door on the lower front surface of the right half-wing on the outside from the engine.
- 4.6.13.6 If the aircraft is powered by the ground power unit or APU, make sure the BATTERY POWER SWITCH is in the OFF position and the cap is closed. If powered by batteries, remove the cap and set the switch to the ON position.
- 4.6.13.7 Start refuelling by monitoring the fuel quantity on the FUEL QTY INDICATOR. Stop refuelling the tank when the required quantity of fuel is reached.
- 4.6.13.8 Refuel the centre tank by transfer from the wing tanks. For such transfer, it is necessary to have power supply on board either from the ground power unit or from the APU (the tank fuel pumps are powered by AC power ~ 115v)
- 4.6.13.9 Refuel the wing tanks if fuel has been transferred to the centre tank.
- 4.6.13.10 If refuelling from the batteries, reset the BATTERY POWER SWITCH to the OFF position and close the cap.
- 4.6.13.11 Close the refuelling panel door.
- 4.6.13.12 Remove the fuelling nozzle and the hose grounding stud (if any)
- 4.6.13.13 Close the fuelling (fill) ports (when closing, make sure that the handle on the fuelling port door is closed and recessed, otherwise the airflow may blow the cap off).
- 4.6.13.14 Remove the stepladder and other equipment used during the refuelling operation.

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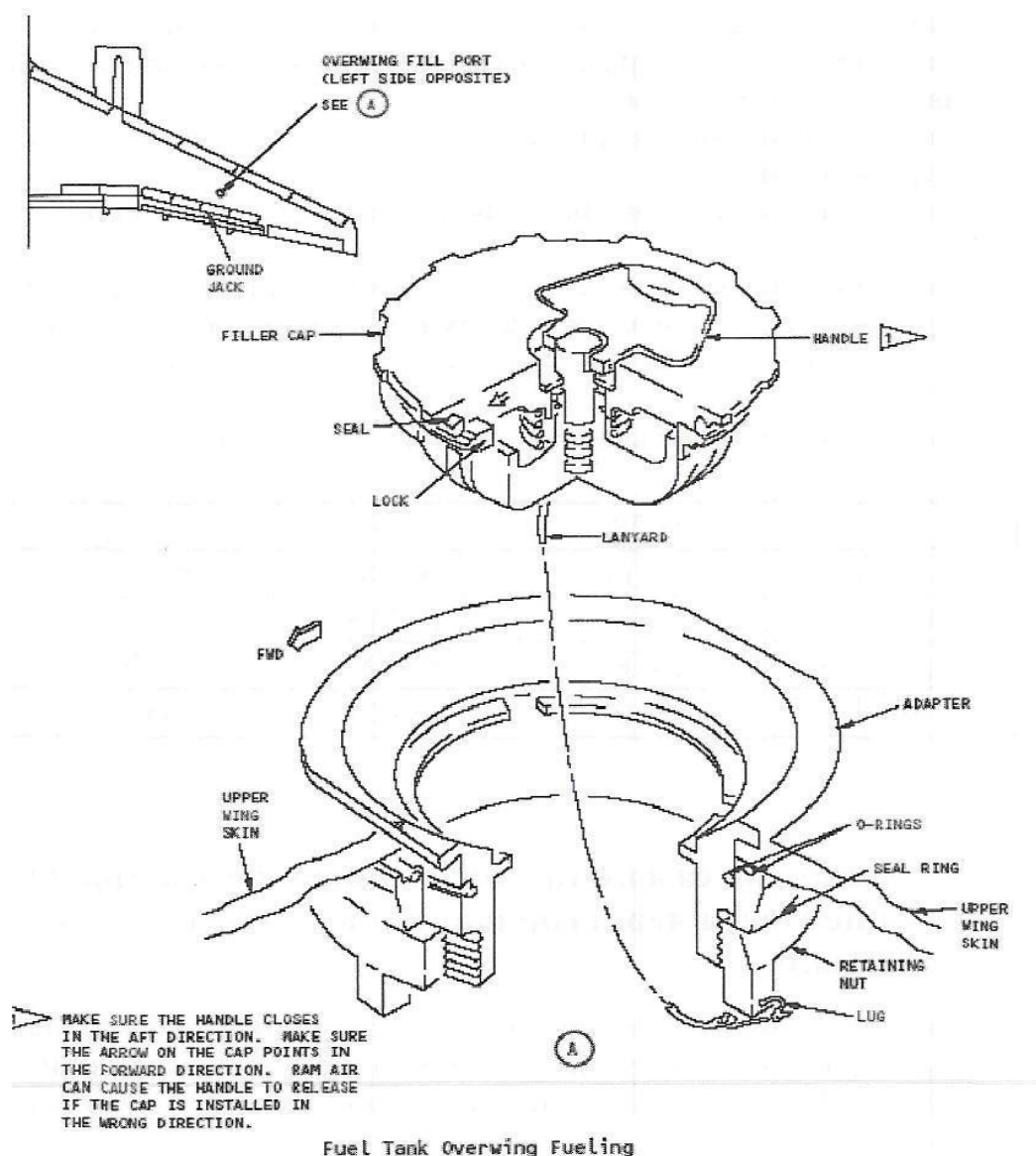


Figure 33. Overwing fuelling port.

4.6.14 Refuelling B757-200PCF aircraft with no power supplied to the fuelling panel.

ATTENTION!

In case of no power supply there is no protection against tank overfilling (tank overpressure may occur) and the fuelling valve will not close automatically.

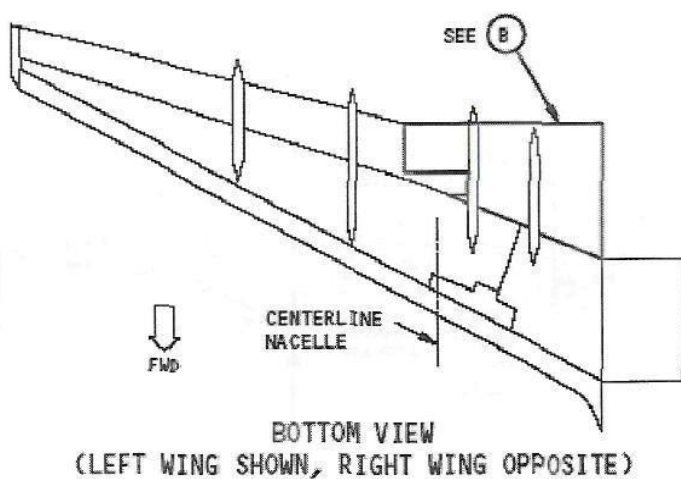
4.6.14.1 The refuelling procedure is similar to that of pressurized refuelling, except that:

- it is recommended to refuel each tank separately as the fuel quantity measuring system does not work in case of no power supply. It is not recommended to refuel the main tanks with over 6400 kg of fuel. The fuel quantity should be checked either through the fuel truck counter or by fuel measuring sticks;
- the fuelling valves must be opened and closed manually. The fuelling valves of the main left and right tanks may be accessed through panels 551BB and 651BB respectively on the bottom surface of the left and right wings.

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4.6.14.2 To open the main tank valves:

- open doors 551BB and 651 BB;
- the fuelling valves are located on the rear wing spar;
- unlock the MANUAL OVERRIDE KNOB;
- turn the MANUAL OVERRIDE KNOB counter clockwise by 10-13 turns.



BOTTOM VIEW
(LEFT WING SHOWN, RIGHT WING OPPOSITE)

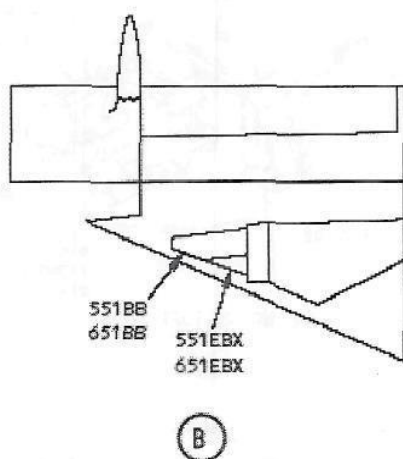


Figure 34. Access to fuelling valves.

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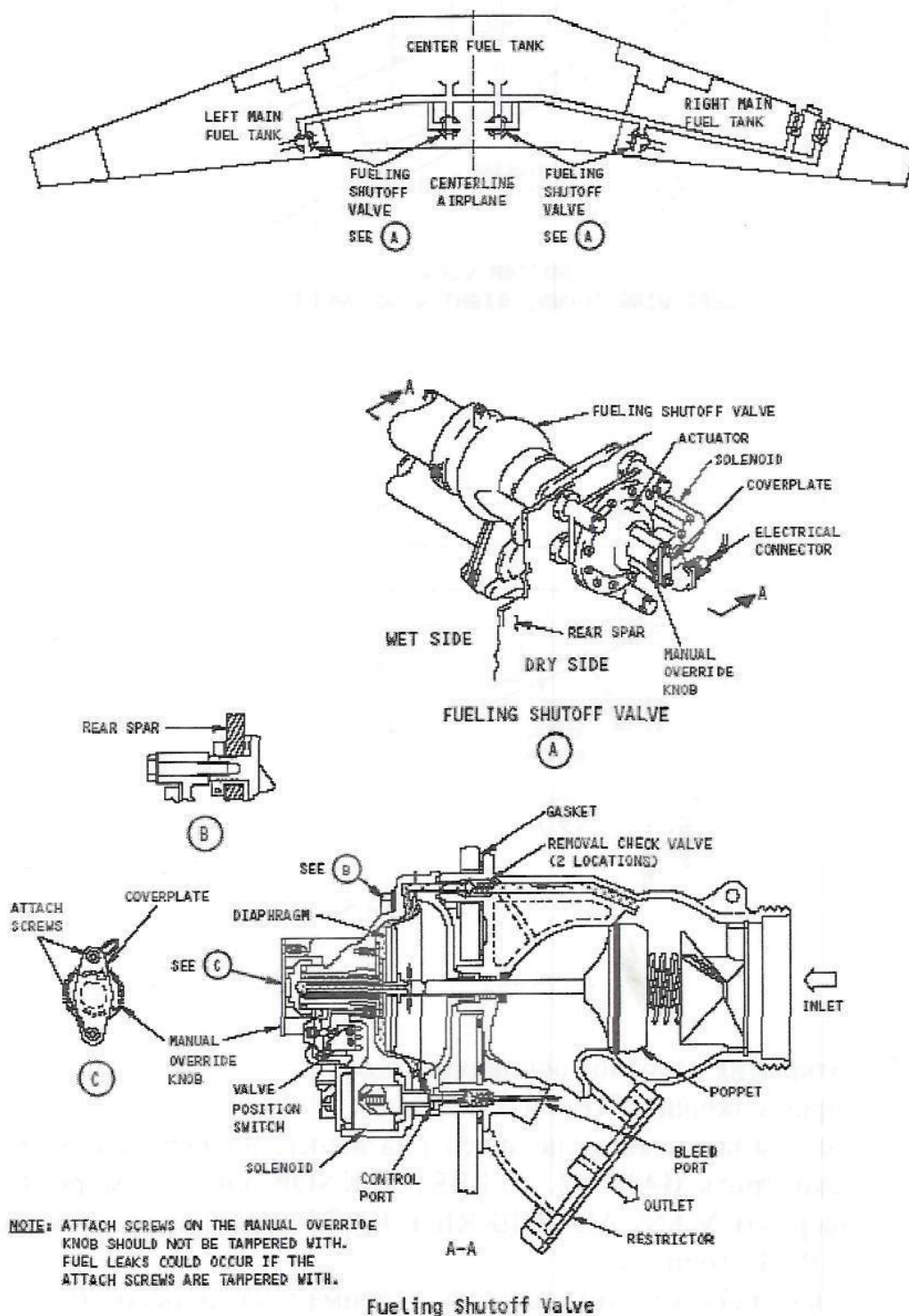


Figure 35. Fueling valve.

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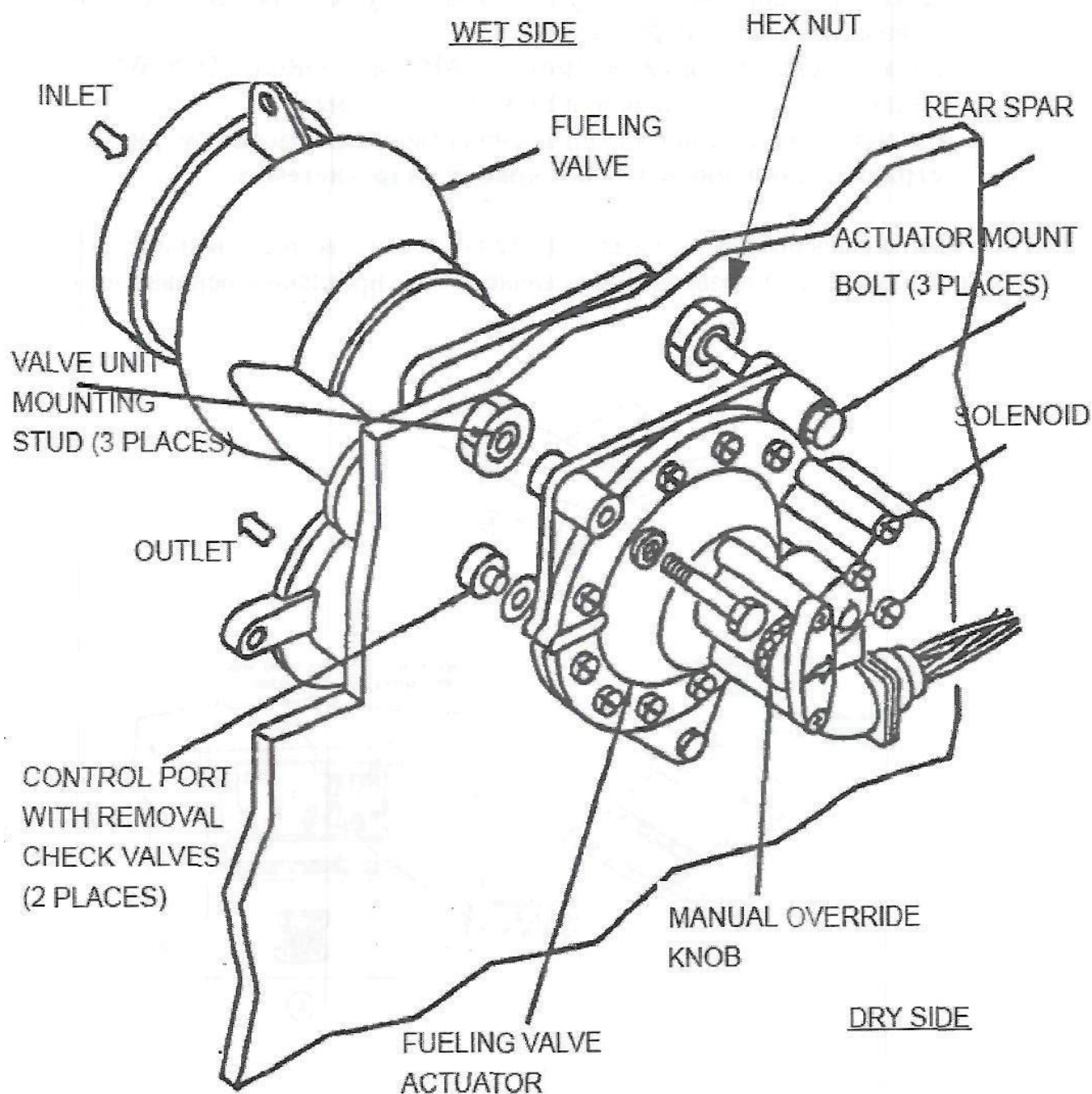


Figure 36. MANUAL OVERRIDE KNOB.

4.6.14.3 After refuelling the required quantity of fuel in the tanks:

- depressurize the refuelling line with a fuel truck;
- turn the MANUAL OVERRIDE KNOB clockwise by 10 - 13 turns until it stops (this can be done with pliers);
- secure the knob with a locking device.

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4.6.14.4 The center tank refuelling valves can be accessed through the main landing gear doors. For this purpose:

- supply power to the aircraft (APU or GROUND POWER);
- pressurize the left and right hydraulic systems;
- open the doors of the landing gear door control panel;
- depressurize the left and right hydraulic systems.

4.6.14.5 The valves are located on the rear wall of the landing gear wheel well to the left and right of the aircraft axis. They are operated in the same way as the main valves.

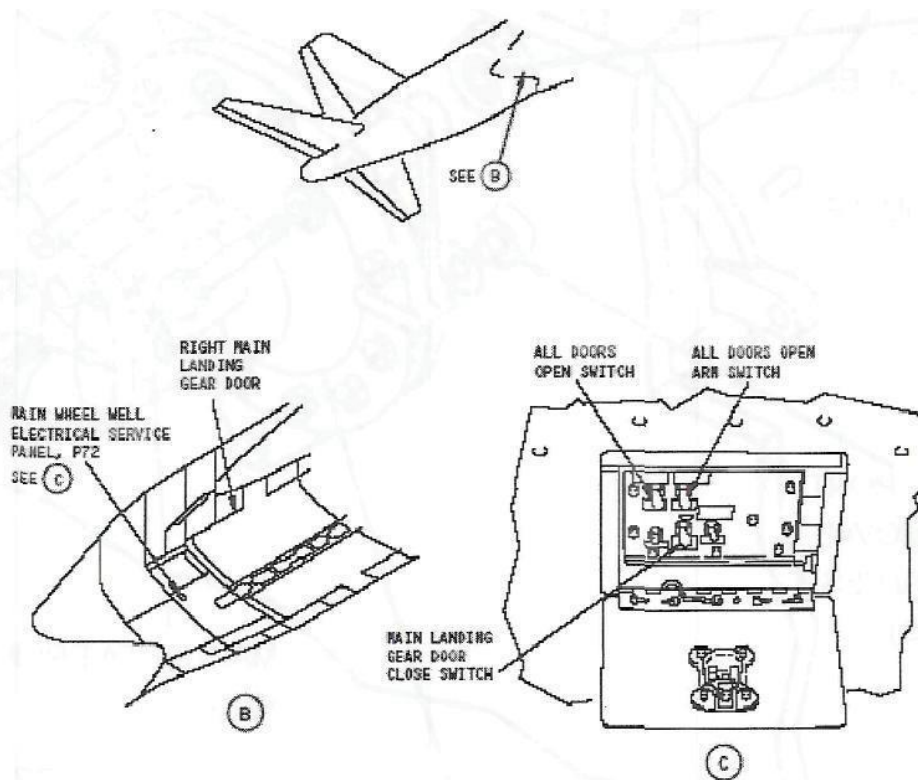


Figure 37. Operation of landing gear doors


4.6.14.6 The main landing gear doors may be closed with a switch on the main landing gear service panel (see Figure 37)

4.6.14.7 To operate the doors, the left and right hydraulic systems must be pre-pressurized.

4.6.15 Transfer of fuel for B757-200PCF aircraft

4.6.15.1 Fuel may be transferred from tank to tank in the following cases:

- the aircraft has been refuelled through the wing fueling ports;
- in case of a large imbalance between the wing tanks (over 800 kg). This procedure requires AC power on board - 115v from the ground power unit or APU.

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4.6.15.2 Make sure the aircraft is grounded.

4.6.15.3 Open the fuel panel door (Opening the fuel panel door unlocks the center tank pumps).

4.6.15.4 Make sure the BATTERY POWER SWITCH on the fuelling panel is in the OFF position and closed with the cap.

4.6.15.5 Press TEST IND to check the panel indicators. Make sure that the upper and lower displays show 88.8.

4.6.15.6 Press and release each indicator lamp for the LEFT MAIN, L CENTER, R CENTER and RIGHT MAIN fuelling valve open position. The lamps should light up and then go down.

4.6.15.7 Press and release the DEFUEL LH OPEN and DEFUEL RH OPEN lamps. The lamps should light up and go down.

4.6.15.8 Open the fuelling valve of the tank to which fuel needs to be transferred.

4.6.15.9 If fuel is to be transferred from the left or right tank, open the appropriate LH DEFUEL or RH DEFUEL defueling valve.

4.6.15.10 If the fuel is to be transferred from one main tank to another, open the CROSSFEED VALVE on the fueling panel in the cockpit.

4.6.15.11 In the cockpit turn on the pumps of the tank from which fuel will be transferred.

4.6.15.12 Carefully monitor the transfer (crossfeed) process. If the LOW PRESSURE indicator lamp of any pump lights up, turn this pump off immediately.

4.6.15.13 When transfer (crossfeed) is complete, turn off the fuel pumps, close the DEFUEL valve, **LEFT, CENTRE, and RIGHT** refuelling (fill) valves, and the CROSSFEED VALVE.

4.6.15.14 Close the fuelling panel door.

4.6.16 Defueling B757-200PCF aircraft

4.6.16.1 Defueling may be possible in two ways:

- by using the aircraft fuel pumps;
- by using the fuel truck (suction defueling).

ATTENTION!

When defueling the aircraft, it is strictly forbidden to operate an SW radio or a weather radar. Doing so may cause a fire or fuel explosion.

ATTENTION!

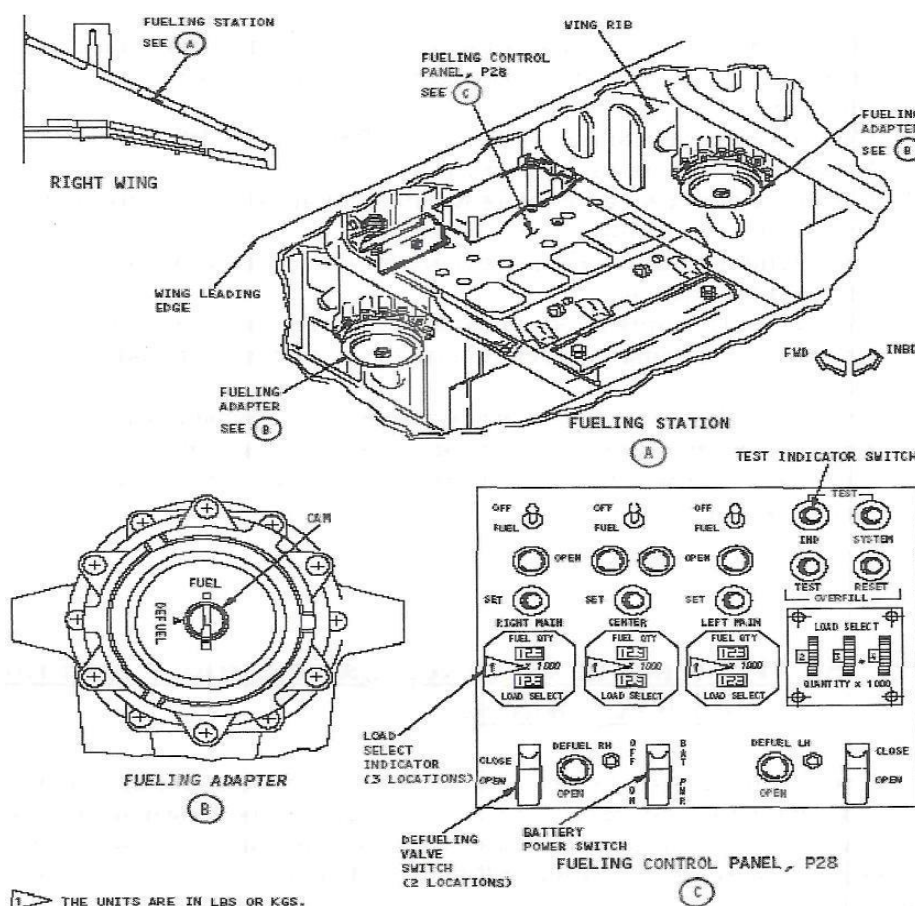
Do not turn on hydraulic system pumps with less than 2 300 kg (600 US gallons) in the main tanks as any smaller quantity would expose the hydraulic system heat exchangers in the tanks and may cause the hydraulic fluid to overheat.

4.6.16.2 Make sure that the aircraft and the fuel truck are grounded to each other and the ground:

- supply power to the aircraft (use the APU or GROUND POWER);
- notify the cabin occupants that the aircraft is being defueled or place a **“DO NOT OPERATE”** plate on the flap control handle
- open the fuelling panel door on the right wing. Make sure that the fuelling panel light turns on (this means that 28v power is being supplied to the fuel system components);
- set CAM on the fuel connections to DEFUEL position (see Figure 40, B view);
- connect the fuel hoses from the fuel truck;

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- set the power switch on the fuelling panel to the appropriate position (if the power is supplied by the APU or GROUND POWER, leave it in the OFF position, if the fuel system is to be powered by the battery, open the cap and set the switch to the ON position);
- check operation of the fuel indicators (press TEST IND in which case 88,8 should appear on the lower indicators of the fuel tank level gauge counters);
- press the open position indicator lamps of the DEFUEL LH and DEFUEL RH defuel valves (the lamps should light up and then go down when they are released);
- set the DEFUEL RH and DEFUEL RH switches to the OPEN position. Make sure the lamps light up. On the fuelling panel in the cockpit, turn on the pumps of the tank which you want to defuel;
- when using the fuel truck to defuel the tanks, the fuel pumps should not be turned on;
- after the required quantity of fuel has been reached, turn off the pumps, set the valves and switches on the fuelling panel to their original positions;
- disconnect the fuel truck, remove grounding (do not forget to move the cams on the fuelling connections/adapters to the FUEL position);
- close the fuelling panel, remove the plate from the flap control handle.



Defueling
Figure 201 (Sheet 1)

Figure 38. Fueling station and fueling adapter.

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4.6.17 Measuring fuel quantity with the fuel measuring sticks / dripsticks on B757-200PCF aircraft.

- 4.6.17.1 This method is alternative for determining the quantity of fuel in the aircraft if the fuel level gauge readings are doubtful. The Dripstick Reading Manual should be used to use the fuel measuring sticks. These tables have been calculated by Boeing Company for a fuel density of 0.8034 kg/L. If the density differs from the above, the relevant adjustment must be made.
- 4.6.17.2 The aircraft shall stand with a roll attitude of no more than + 2 degrees and a pitch attitude of no more than + 2 degrees. The tables have been calculated to an accuracy of 0.5 degrees on pitch and 0.25 degrees on roll.
- 4.6.17.3 Each main fuel tank has 5 dripsticks located on the underside of the wing. The centre tank has 4 dripsticks.
- 4.6.17.4 The dripsticks are numbered starting from the aircraft axis. The centre tank dripsticks are numbered No. 1 and No. 2, and the other dripsticks are numbered No. 3 ... No. 7 (in the main tanks) respectively from the axis of the aircraft to the end of the wing. The accuracy of measurement is + 50 kg for the main tanks and + 100 kg for the centre tank.

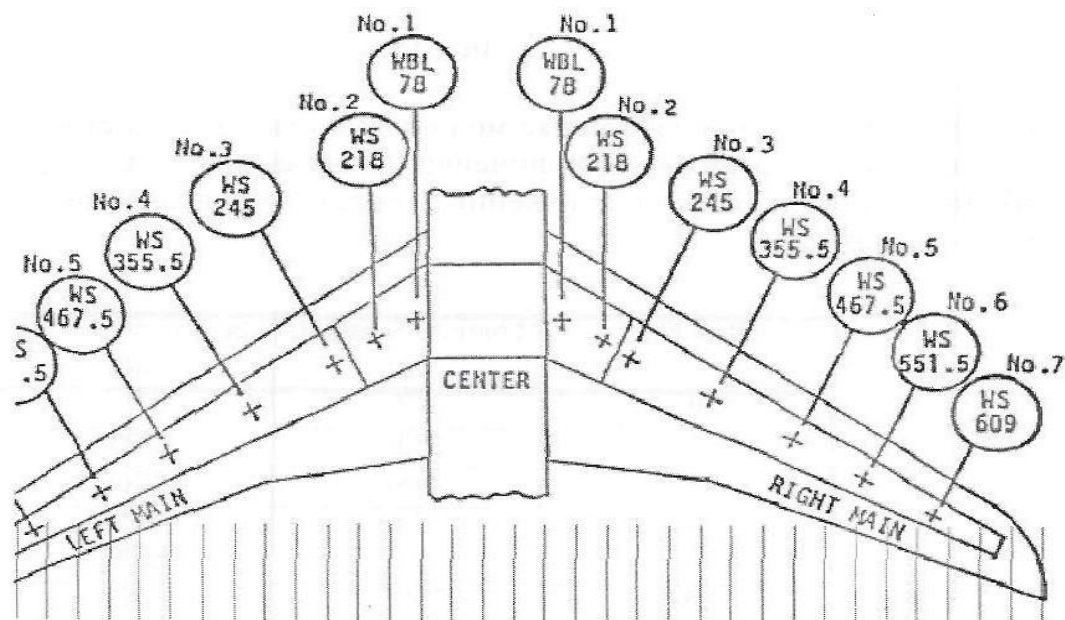


Figure 39. Location of fuel measuring sticks / dripsticks.

- 4.6.17.5 The division value of the centre tank dripsticks is 100 kg, and that of the main tanks is 50 kg, respectively.
- 4.6.17.6 A dripstick is secured with a latch in the lock on the underside of the wing. Turning the lock counter clockwise releases the dripstick and it falls out of the cup. Depending on the fuel quantity, it stops at a certain height.

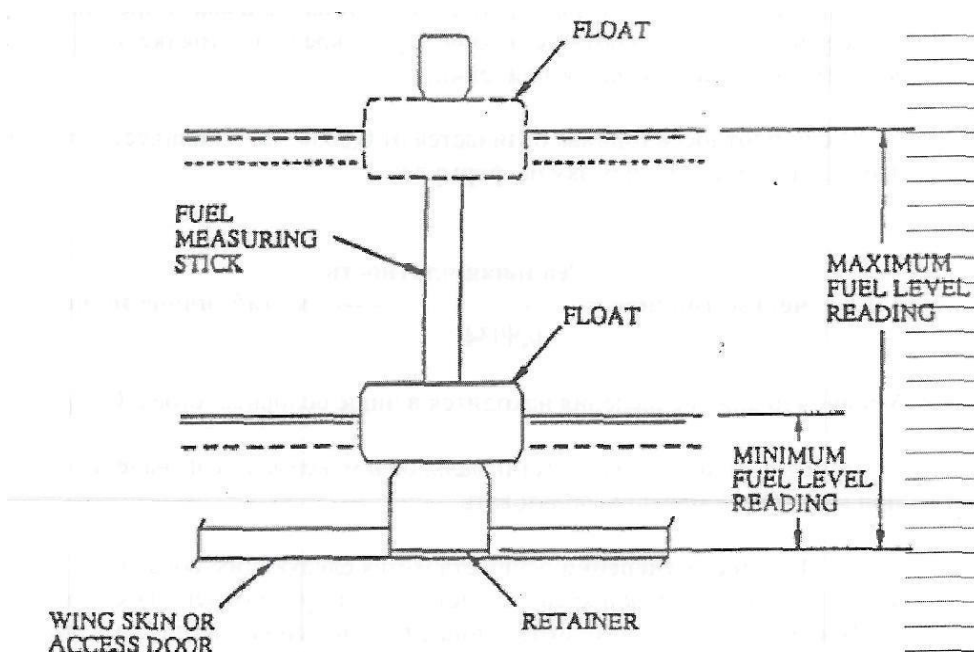


Figure 40. A fuel measuring stick / dripstick.

4.6.17.7 Using the scale on a dripstick, it is possible to read the quantity of fuel in kg.

4.6.17.8 The measurement limits of each dripstick are shown in Table 4. The measurement limits of each dripstick are shown in Table 2. The data in the table is given subject to the aircraft position: pitch attitude - 0.3 degrees, roll attitude - 0 degrees.

stick No.	Minimum Reading (kg)	Maximum Reading (kg)
1	895	9750
2	8835	20981
3	306	2569
4	1750	4419
5	4268	5837
6	5593	6292
7	6252	6780

Table 4.

4.6.17.9 The DRIPSTICK READING MANUAL tables can be used to determine the quantity of fuel in the tank depending on the aircraft position. Each table corresponds to a specific dripstick and pitch attitude. A sample table is shown in Table 3. As it can be seen, the quantity of fuel in the tank is determined at the intersection of the column corresponding to the roll attitude at the stand and the row corresponding to the dripstick reading.


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Table 2
DRIPSTICK READING MANUAL

FUEL MEASURING STICK NUMBER STICK NO. 7 MAIN TANK
PITCH ATTITUDE = -1.80 DEGREES (POSITIVE IS NOSE HIGH)

MEASURING STICK LEVEL IN KILOGRAMS	USABLE FUEL IN KILOGRAMS BASED ON FUEL DENSITY OF 6.7 LBS/U.S. GAL								
	ROLL ATTITUDE IN DEGREES (POSITIVE IS WING HIGH)								
	-2.00	-1.75	-1.50	-1.25	-1.00	-.75	-.50	-.25	0.00
6200.0	5919	5994	6060	6118	6169	6212	6250	6281	6307
6250.0	5993	6060	6119	6171	6215	6252	6284	6311	6333
6300.0	6082	6143	6195	6240	6279	6311	6338	6360	6378
6350.0	6175	6228	6274	6313	6346	6373	6395	6413	6428
6400.0	6246	6292	6331	6364	6390	6412	6429	6443	6454
6450.0	6339	6378	6411	6438	6460	6478	6491	6501	6509
6500.0	6441	6473	6500	6522	6539	6551	6561	6567	6572
6550.0	6518	6544	6566	6584	6597	6606	6613	6617	6620
6600.0	6600	6621	6637	6650	6659	6665	6669	6670	6671
6650.0	6673	6689	6702	6711	6717	6721	6722	6723	6722
6700.0	6750	6761	6769	6774	6777	6779	6778	6777	6774

Note. If the fuel density differs from 0.8034, the fuel quantity must be adjusted according to the formula. The actual density shall be: $\text{Fuel quantity} = \frac{\text{Actual density}}{0.8034} \times \text{the table value}$. The level gauge is located in the MLG wheel well (see Figure 41). Each of the dripsticks has the minimum and maximum value of the quantity at which it can be used.

4.6.17.10 Measurement procedure is carried out as follows:

4.6.17.10.1 Determine the aircraft pitch and roll using the plumb bob (see Figure 41). The measurement (levelling) scale is located in the right MLG wheel well. Attach the plumb bob to the scale by using the attach fitting (located above). Determine the pitch and roll by using the scale.

4.6.17.10.2 Measure the quantity of fuel in the tank by using the appropriate dripstick. If the quantity of fuel in the tank is roughly known, a specific dripstick should be used. If the quantity of fuel is not known, the furthest dripstick should be used. If the quantity of fuel measured with this dripstick does not match the quantity as per the table, it is necessary to use the next dripstick (closer to the fuselage). Repeat the measurement several times to make sure the measurement is correct.

4.6.17.10.3 If the fuel density is not 0.8034, make an adjustment by using the above formula.

4.6.17.10.4 After measuring, put the dripsticks in place and rotate clockwise by 90 degrees until they lock.

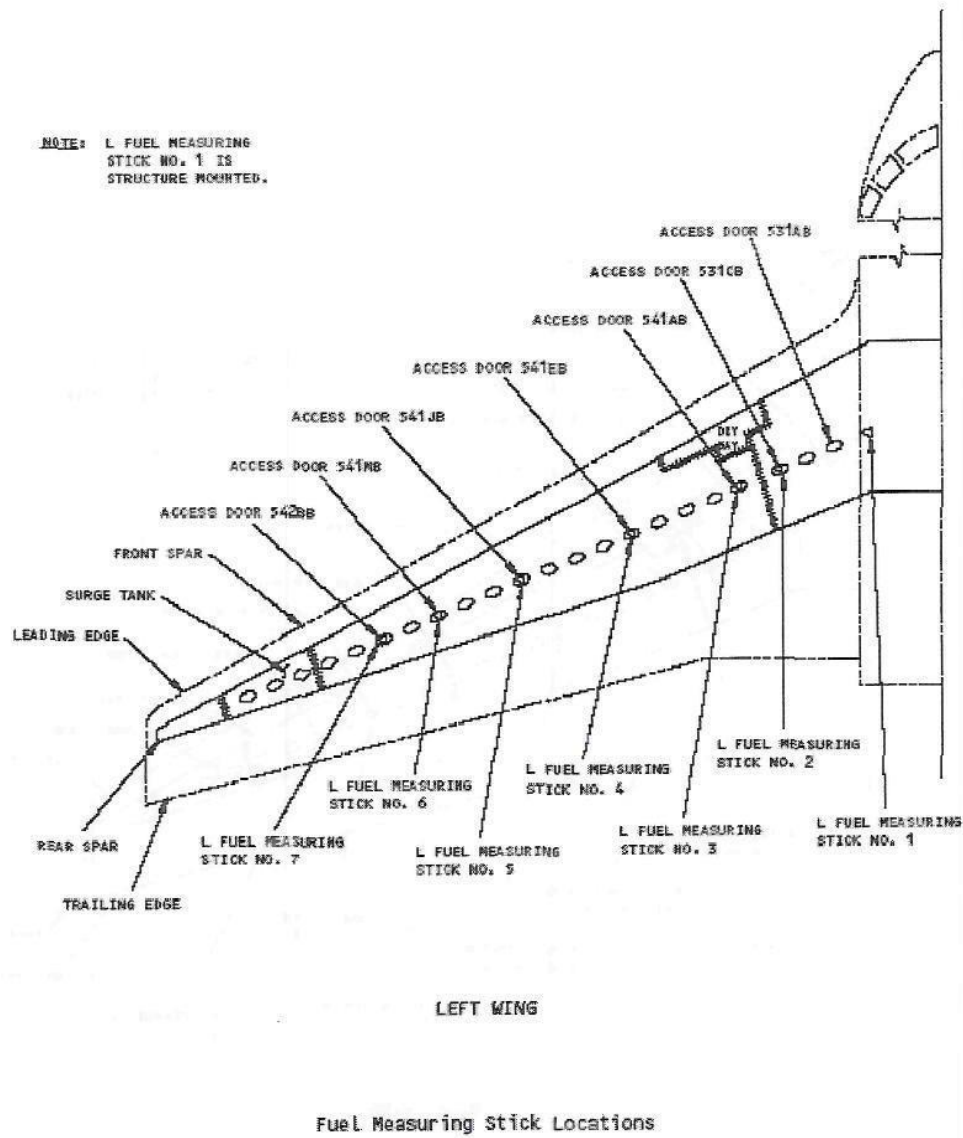
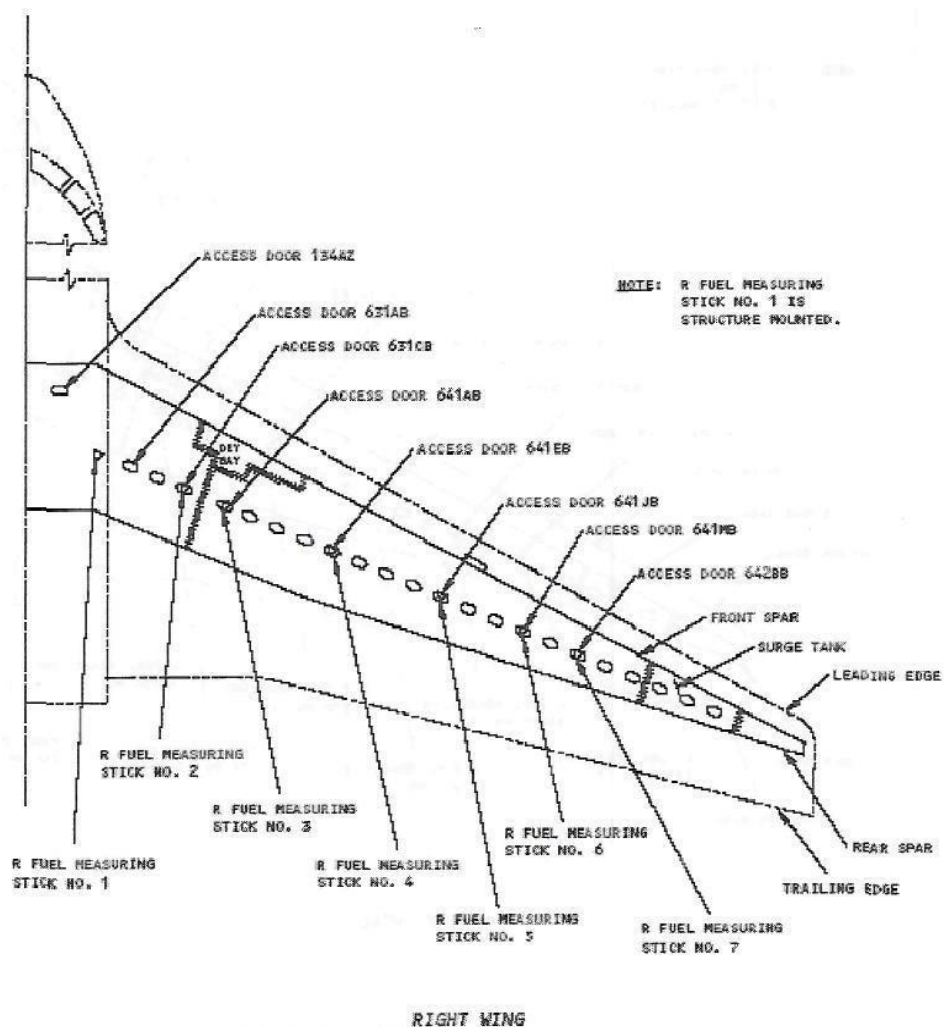


Figure 42. Fuel Measuring Stick / Dripstick Locations.

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Fuel Measuring stick Locations

Figure 42a. Fuel Measuring Stick / Dripstick Locations.

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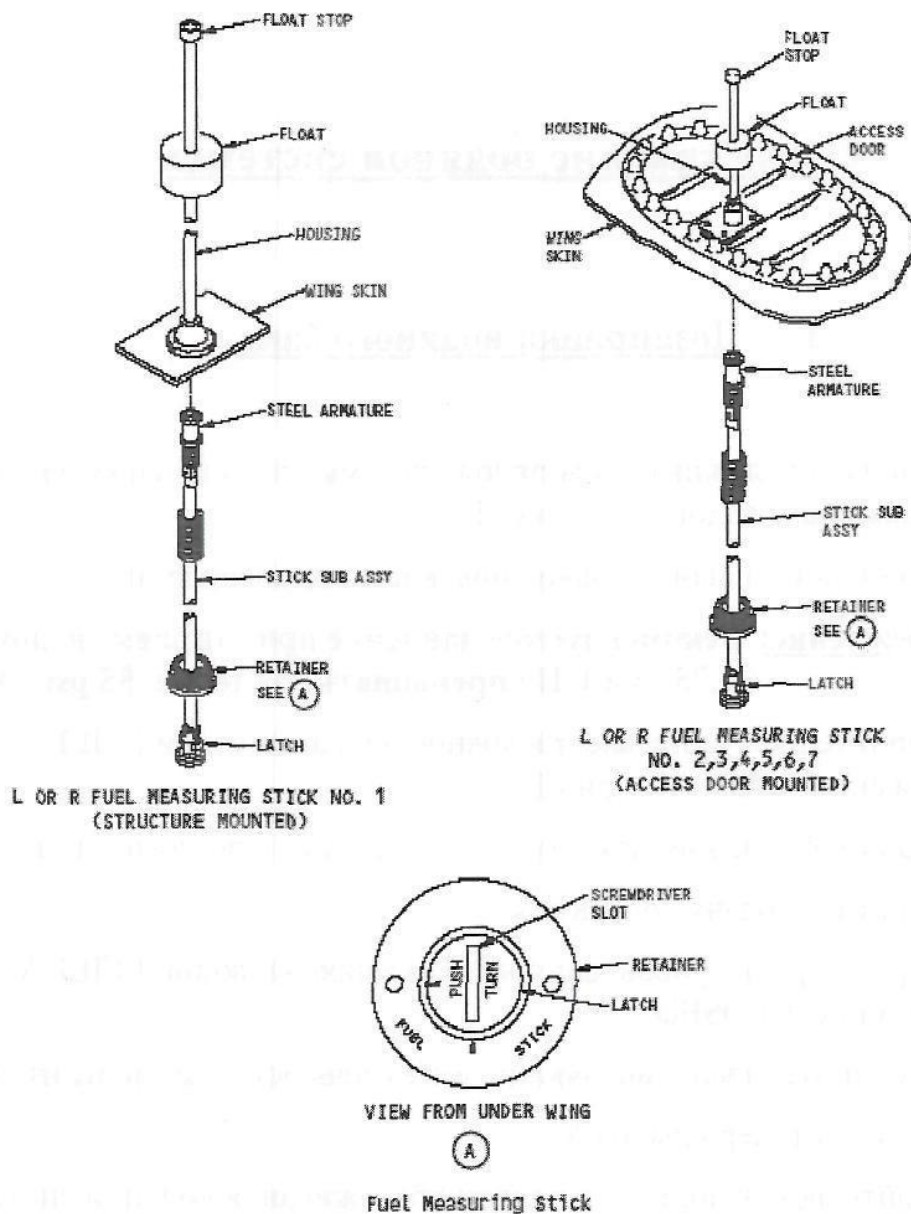


Figure 43. Fuel Measuring Sticks / Dripsticks.

4.6.18 Guidelines for B757-200PCF aircraft lavatory servicing

- 4.6.18.1 Disengage the WATER HEATER fuse on panel P11-4.
- 4.6.18.2 Open the FLUSH MOTOR circuit breaker on panel P11.
- 4.6.18.3 Open the lavatory service panel door.

ATTENTION!


Do not allow the toilet fluid to come in contact with the aircraft structure, as the fluid can cause corrosion and damage to the aircraft structure. Rinse the area immediately with water and soap.

- 4.6.18.4 Open the waste tank drain connection door.

Note. Fluid in the drain line suggests that the drain valve may be leaking.

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4.6.18.5 Connect the drain line of the lavatory service truck to the rinse/fill connection.

4.6.18.6 Connect the drain hose of the lavatory service truck to the waste tank drain connection.

4.6.18.7 If the drain hose of the lavatory service truck has a Y-fitting, fully extend the T-handle.

Note. This gives clearance for the flap valve in the waste tank drain connection.

4.6.18.8 Open the flap valve in the waste tank drain connection.

Note. To do this, turn the lever by 1/4 turn in the direction of the OPEN arrow.

4.6.18.9 Pull the T-handle on the service panel down and turn it to lock the drain valve open.

4.6.18.10 Make sure you can hear or feel the flow in the drain hose.

4.6.18.11 After draining the toilet, push the T-handle on the service panel upward to close the drain valve.

Note. Turn the T-handle to an unlocked position before moving it to the closed position.

4.6.18.12 Pump a minimum of 6 gallons of water through the rinse/fill connection to rinse the toilet tank. While pumping water, pull and release the T-handle on the service panel from 3 to 10 times to clear the drain valve.

Note. The toilet tank capacity is 9 Gallons (34 Ltr) Do not allow fluid in the tank to exceed this value during service.

4.6.18.13 Stop the pump of the lavatory service truck.

4.6.18.14 Pull the drain valve handle down and turn it to lock the drain valve open.

4.6.18.15 Fully drain the toilet tank.

4.6.18.16 Unlock and release the drain valve handle to close the drain valve.

Note. Let the drain valve handle move quickly to the closed position. This ensures a waterproof sealing of the drain valve.

4.6.18.17 Turn the CLOSED lever in the direction of the CLOSED arrow and hold the lever in the closed position.

4.6.18.18 Turn the OPEN lever in the opposite direction to the OPEN arrow to lock the valve flap in the closed position.

4.6.18.19 For a drain connection door with a lever that can be opened by pushing the flap, close and lock the drain connection door.

Note. The flap will move to the closed position as soon as the drain connection door moves to the closed position.

4.6.18.20 Disconnect the drain line.

4.6.18.21 Disconnect the drain hose.

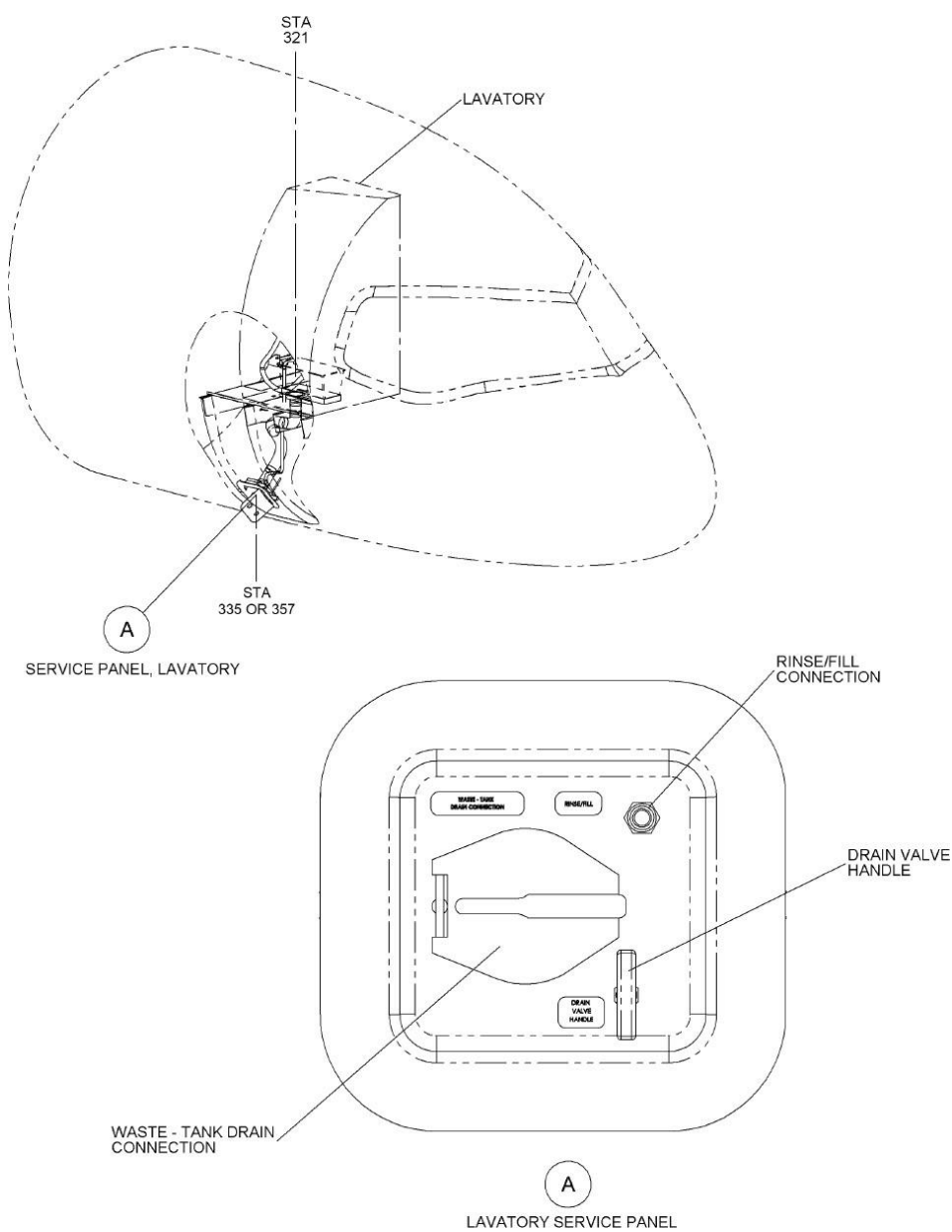


Figure 44. Lavatory Service Panel.

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4.6.19 Guidelines for connecting/disconnecting the 115/200V 400Hz ground power unit to/from B757-200PCF aircraft

4.6.19.1 When preparing for the flight and engine start-up, a ground power unit of three-phase alternating current with a grounded neutral power of $208/120\text{ V} \pm 2\%$ voltage, $400\text{ Hz} \pm 2\%$ frequency and a power of at least 60 kva (Ground Power Unit) is used for aircraft maintenance. A six-pin external power receptacle is provided for the 200V AC ground power supply. Four (larger) pins supply AC power to the on-board electric system, the other (smaller) two pins supply DC power to the Bus Power Control Unit. When connecting the ground power unit, the Ground Handling Bus / Ground Service Bus and main AC buses are powered.

4.6.19.2 The receptacle is located at the underside of the fuselage behind the nose landing gear, on panel P30.

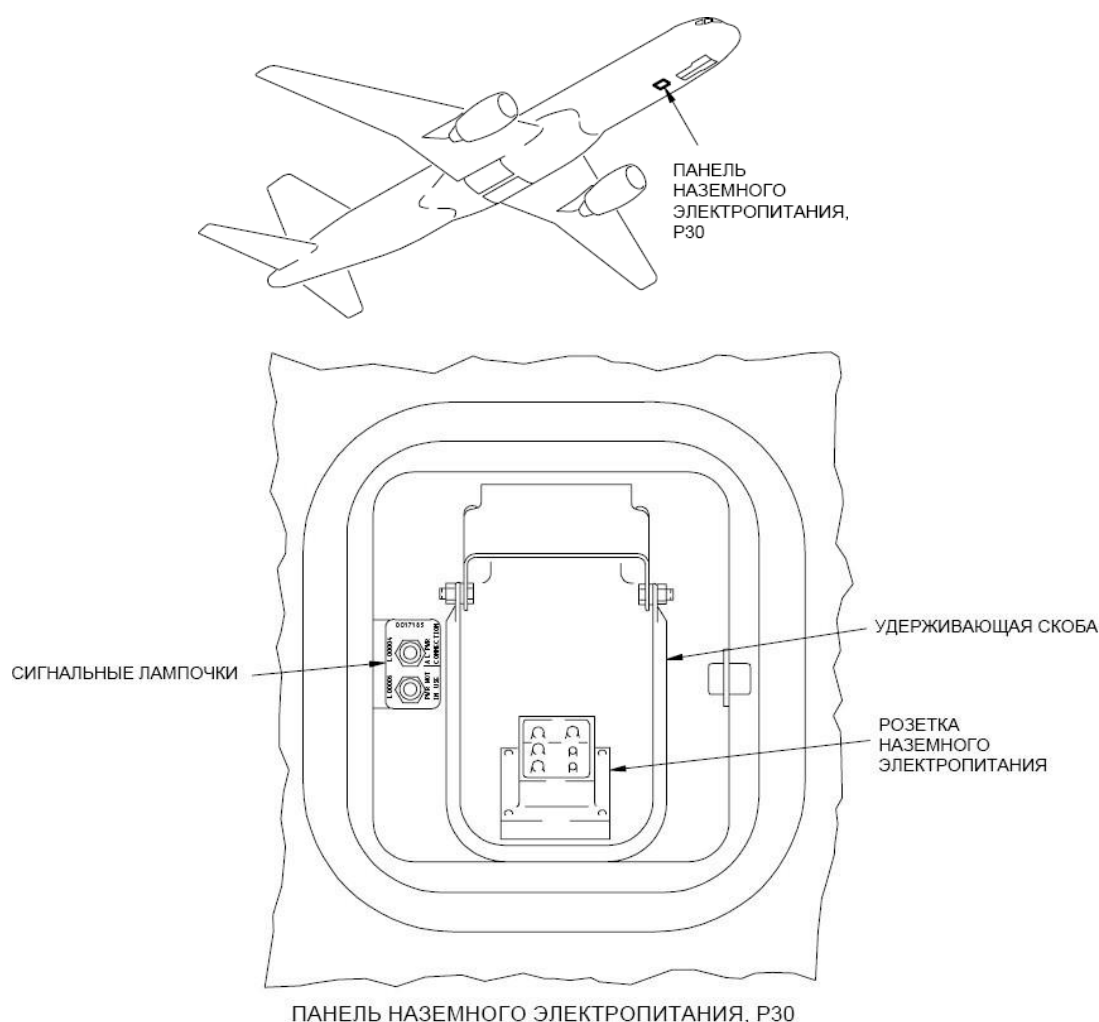


Figure 45. External Power Panel.

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4.6.19.3 Before connecting the ground power unit plug to the external power receptacle (on the aircraft), it is necessary to check and make sure that:

- the pins of the external power receptacle on the aircraft are undamaged and clean;
- the sockets in the external power unit plug are undamaged and clean;
- there is no jumper between sockets E and F.

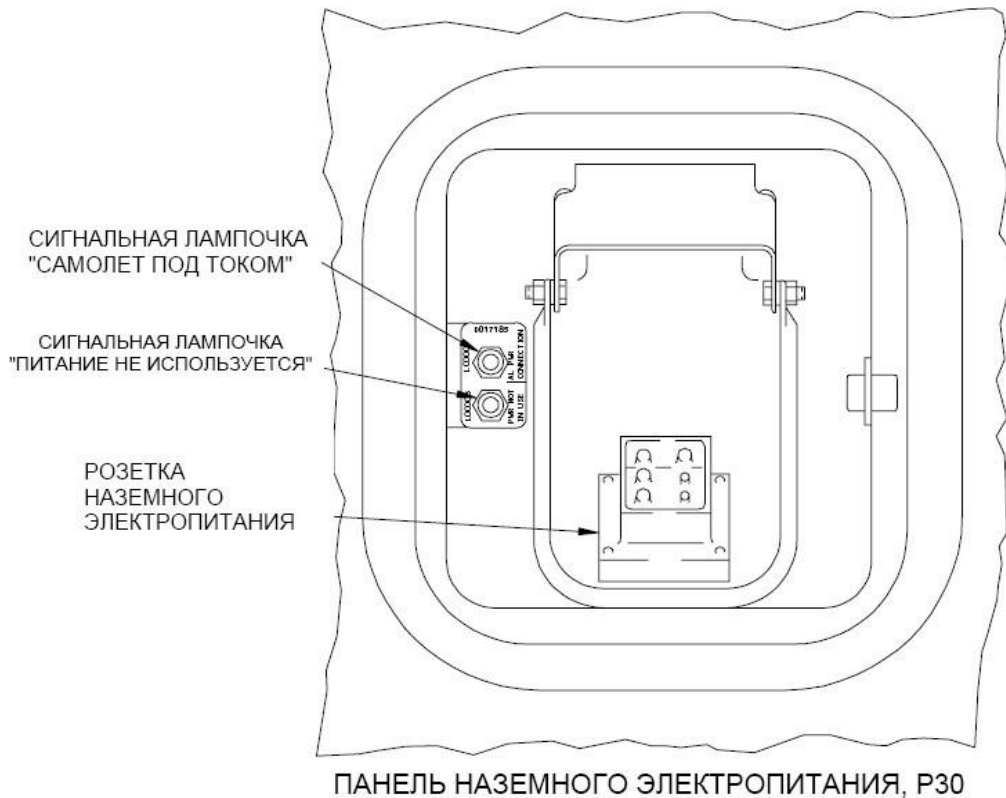


Figure 45a. External Power Panel.


4.6.19.4 Connecting the ground power unit to the aircraft electrical system:

- open the external power panel door;

ATTENTION!

Do not connect the external power cable when the ground power unit is switched on, it may cause an electric shock.

- connect the GPU cable to the aircraft receptacle.
- secure the cable with a retaining clip.
- switch on the GPU.
- make sure that the following indicator lamps on the external power panel light up in white:
- CONNECTED indicator lamp;
- NOT IN USE indicator lamp.

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4.6.19.5 Disconnecting the ground power unit from the aircraft electrical system.

4.6.19.5.1 Press the EXT PWR button – the ON sign will go down, the AVAIL sign will remain (if the GPU is connected).

4.6.19.5.2 Press and turn the STBY POWER rotary switch to the OFF position.

4.6.19.5.3 Press and release the battery button under the cap (the cap remains open, and the ON sign goes down).


ATTENTION!

Before disconnecting the electrical cable, make sure that no power is supplied to the cable. The electric arc produced by disconnecting the cable can seriously damage the aircraft electronic equipment and cause injury.

4.6.19.5.4 Disconnect the electrical cable by wiggling the external power receptacle. Close the external power panel door.

4.6.19.6 Main specifications of ground power units for Boeing 757

Max Power Consumption	90 KVA (continuous)
Peak Power Consumption	150 KVA (5 Seconds)
Average Power Consumption	60 KVA (continuous)
Voltage Requirements (at airplane receptacle):	
Normal Voltage Range	115 ± 2 VAC (No load to 90 KVA)
Allowable Voltage Range	115 ± 5 VAC (90 KVA to 150 KVA)
Frequency Requirements:	
Normal Frequency Range	400 ± 5 Hz
Allowable Frequency Range	400 ± 20 Hz
Max Distortion Factor:	
Total Harmonic Content	3% of fundamental
Individual Harmonic Content	2% of fundamental
Crest Factor	1.414 ±0.07
Max Voltage Modulation Factor	0.5%
Protection Circuits (on airplane);	
Overvoltage	129 VAC Threshold, Inverse TD
Undervoltage	106 VAC Threshold, 9 Second TD
Overfrequency	425 Hz Threshold, 1 Second TD
Underfrequency	375 Hz Threshold, 1 Second TD
	355 Hz Threshold, 0.15 Second TD

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4.6.20 Guidelines for opening/closing the baggage compartment doors of B757-200PCF aircraft.

4.6.20.1 The aircraft has three baggage compartments, forward, aft and main. The forward and aft baggage compartment doors are similar in design.

4.6.20.2 No. 1 baggage compartment door is located in front of the wing, on the right side of the fuselage underside and when open, the door opening dimensions are: 1.397 meters wide, 1.079 meters high, and approximately from 2.464 to 2.667 meters above the ground.

4.6.20.3 No. 2 baggage compartment door is located behind the wing, on the right side of the fuselage underside and when open, the door opening dimensions are: 1.397 meters wide, 1.118 meters high, and approximately from 2.311 to 2.515 meters above the ground.

4.6.20.4 Opening of the baggage compartment door locks may be done manually from the outside or inside the aircraft. Opening of the baggage compartment door locks may be done electrically or manually from the outside or inside the aircraft. The baggage door locks may be closed manually only from the outside of the aircraft. The baggage door is equipped with lighting to facilitate baggage loading. The door can be left open in any position with a wind speed not exceeding 33.44 m/s. The door electric motor is designed to operate in wind speeds not exceeding 20.58 m/s. If the wind speed exceeds this value, the electric motor will not have enough power to open the door.

4.6.20.5 Electric opening/closing of No. 1 and No. 2 baggage compartment doors.

ATTENTION!

Do not open the door at wind speeds exceeding 20 m/s. Do not leave the door open at wind speeds exceeding 34 m/s. It may cause damage to the door structure.

To avoid the motor overheating, the door must be opened/closed at intervals of at least 5 minutes.

Make sure there are no foreign object debris in the door opening. If you close the door, foreign object debris may damage the door structure.

Make sure the baggage lashing net is secured before closing the door. When you close the door, any loose net may damage the door structure.

Unlocking and opening the baggage compartment door can be done from the inside of the aircraft but closing and locking the door may only be done from the outside of the aircraft.

The door movement can be stopped or completely changed at any point by moving the switch to the off, open or close position.


Make sure that the equipment and servicing personnel do not interfere with the door free opening before pressing the door open/close switch. The door may continue its movement after you have released the switch. This may cause injury to the servicing personnel and damage to the equipment.

4.6.20.5.1 Door opening.

- supply power to the aircraft electrical system;
- pull the door lock release lever all the way back (out to an angle of approximately 105°);
- open the baggage compartment door control panel cover;
- set and hold the door open/close switch in the OPEN position until the door opens fully.

4.6.20.5.2 Door closing.

- supply power to the aircraft electrical system, if necessary;
- clear the door opening of foreign object debris, if necessary;

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- secure the baggage net, if necessary;
- set and hold the door open/close switch in the CLOSE position until the door is fully closed;
- close the baggage compartment door control panel cover;
- make sure that the door has stopped before entering the door motion area;
- remove the door lock lever in the recess on the door;
- check that the decompression hatches are open before the lever is retracted and closed when the lever is in the retracted position;
- check if the lever locks freely.

4.6.20.6 Ручное открытие / закрытие дверей багажных отсеков № 1 И № 2

ATTENTION!

Do not open the door at wind speeds exceeding 20 m/s. Do not leave the door open at wind speeds exceeding 34 m/s. It may cause damage to the door structure.

Do not use excessive force with the door open/close lever. The maximum force to be applied to the lever is 1.924 kilograms per meter. If more force is applied, the door may be damaged.

If using a pneumatic or power tool, do not apply force of more than 2.592 kilograms per meter and do not rotate at speeds greater than 500 rpm. Larger values may cause damage to the door.

A sudden increase in torque indicates that the door is in the up position.

4.6.20.6.1 Door opening.

- pull the door lock release lever all the way back (out to an angle of about 105°);
- insert a 3/8-inch brace drill (pneumatic electric tool) into the manual door open/close connection and rotate counter clockwise until the door is in the up position (approximately 600 rotations);
- remove the brace drill (pneumatic electric tool) from the manual door open/close connection.

4.6.20.6.2 Door closing.

- clear the door opening of foreign object debris, if necessary;
- secure the baggage net, if necessary;
- insert a 3/8-inch brace drill (pneumatic electric tool) into the manual door open/close connection and rotate clockwise until the door is in the down position (approximately 600 rotations);
- remove the brace drill (pneumatic electric tool) from the manual door open/close connection;
- remove the door lock release lever in the recess on the door.

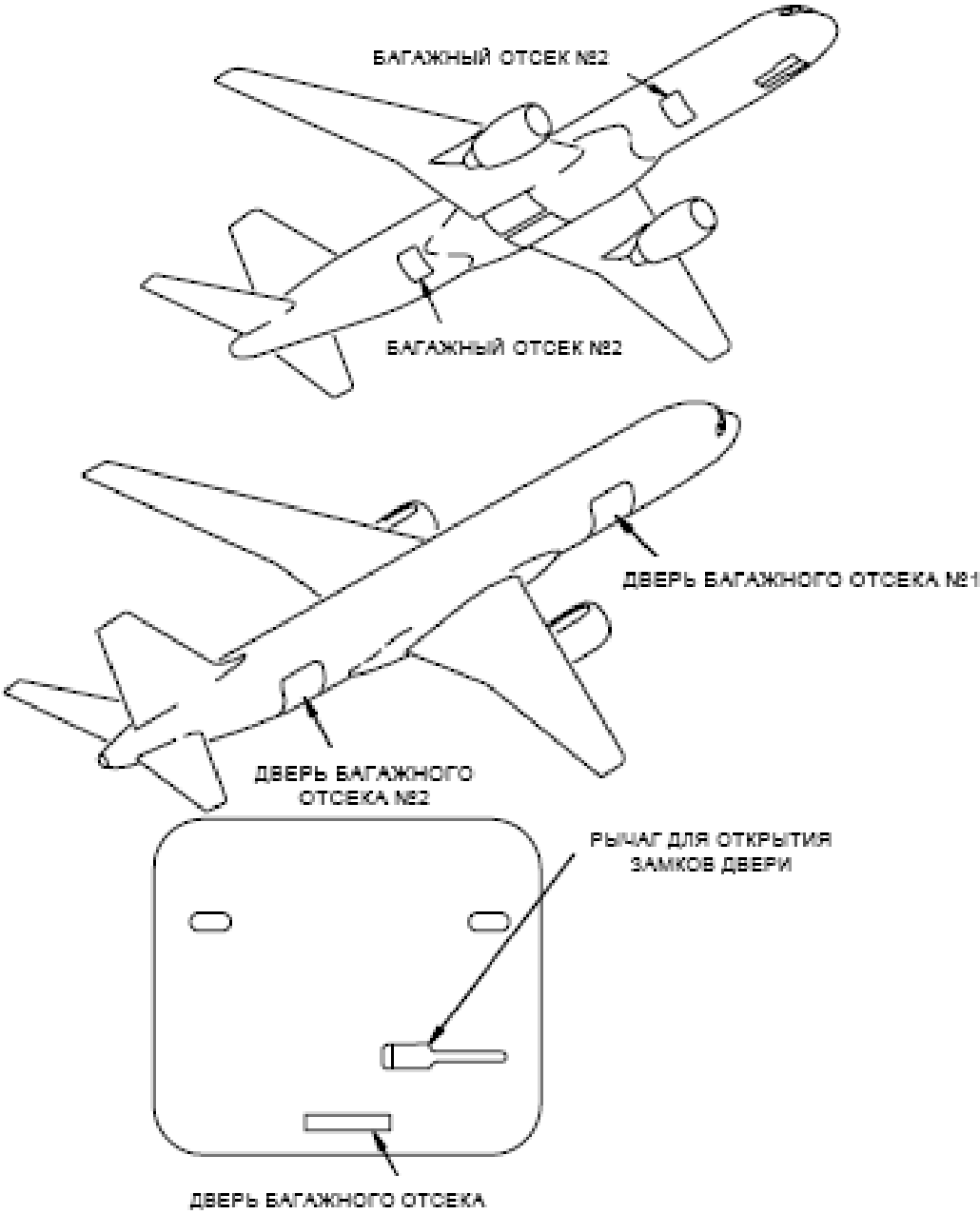


Figure 46. Baggage Compartment Doors.

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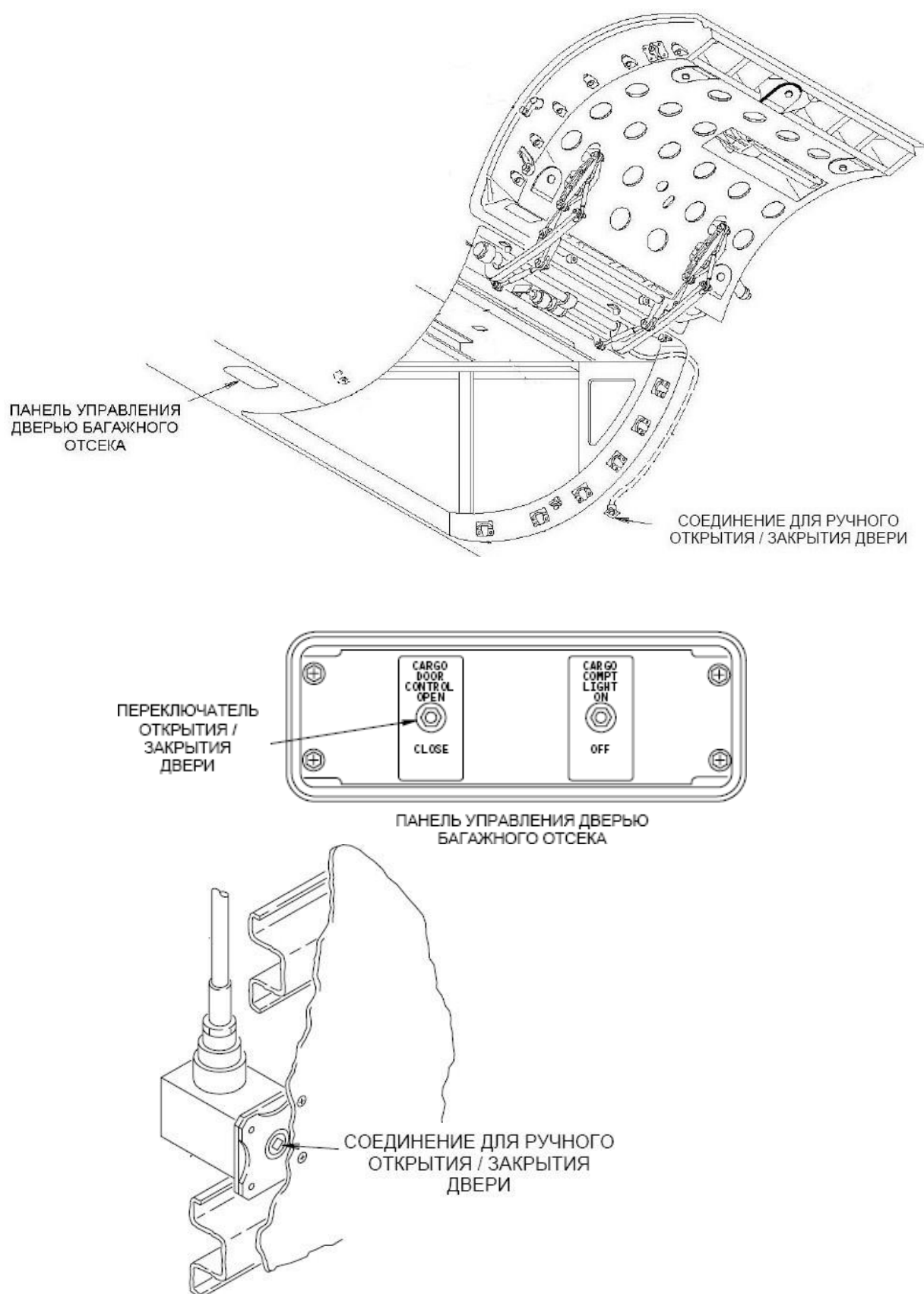


Figure 47. Baggage compartment door opening controls.

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4.6.21 Opening / closing the main cargo door

4.6.21.1 The cargo door is controlled from the door control panel located on the front bulkhead next to L1 crew entrance door. The panel is mounted on the back of the first controller's seat.

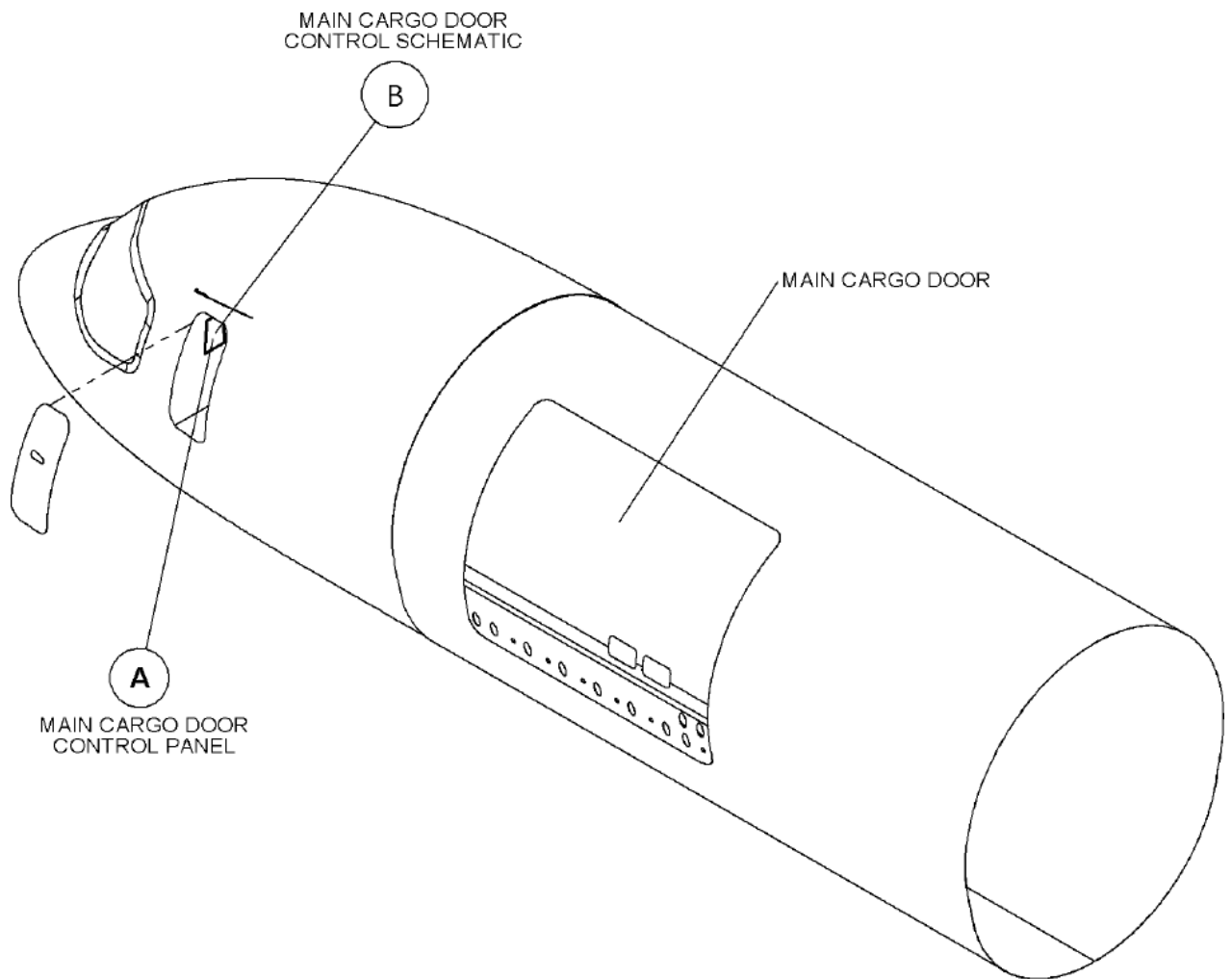


Figure 48. General appearance of the main cargo door.


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Figure 49. Main Cargo Door Control Panel.

ATTENTION!

Do not open the door at wind speeds exceeding 23 m/s which may cause damage to the door structure.

4.6.21.2 Opening.

Note. Make sure that 28V DC / 115V AC power is supplied.

4.6.21.2.1 Turn to and hold the DOOR POWER ENABLE switch in the ON position.

4.6.21.2.2 The ventilation door opens, the VENT DOOR OPEN indicator on the control panel and the MAIN CARGO DOOR indicator in the cabin or on the control panel, or on both light up.

4.6.21.2.3 The latch pins will be removed from the latches and the NOT LOCKED indicator will light up on the control panel.

4.6.21.2.4 The torsion tube will rotate, releasing the roller retainers. Herewith, the NOT LOCKED indicator on the control panel will light up.

4.6.21.2.5 The door will then begin to open and the NOT LOCKED indicator on the panel will light up. When the door reaches its fully open position, the DOOR OPEN microswitch will activate, which disconnects power to the pump. This prevents an excessive load on the door.

Note. When the cargo door is open and the power is on, all indicators on the control panel and in the cab shall be on.

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4.6.21.3 Closing.

4.6.21.3.1 Move to and hold the DOOR POWER ENABLE switch in the ON position and the DOOR CONTROL switch in the CLOSE position.

4.6.21.3.2 The pump will start, and the door will begin to close. When the door is fully closed, the NOT LOCKED indicator on the control panel will go down.

4.6.21.3.3 The torsion tube rotates thus locking the roller retainers and extinguishing the NOT LOCKED indicator on the panel.

4.6.21.3.4 The locking pins will then enter the latches extinguishing the NOT LOCKED indicator.

4.6.21.3.5 The ventilation door closes, and the VENT DOOR OPEN indicator goes down.

4.6.22 Connecting the ASU (Air Start Unit) to B757-200PCF aircraft

4.6.22.1 Ground the aircraft.

4.6.22.2 Open the 193JL Engine Ground Start Access and 194FR Engine Ground Start Access doors

Note. There are two flanges to connect an external air start unit – to ensure the possibility to connect two air start units.

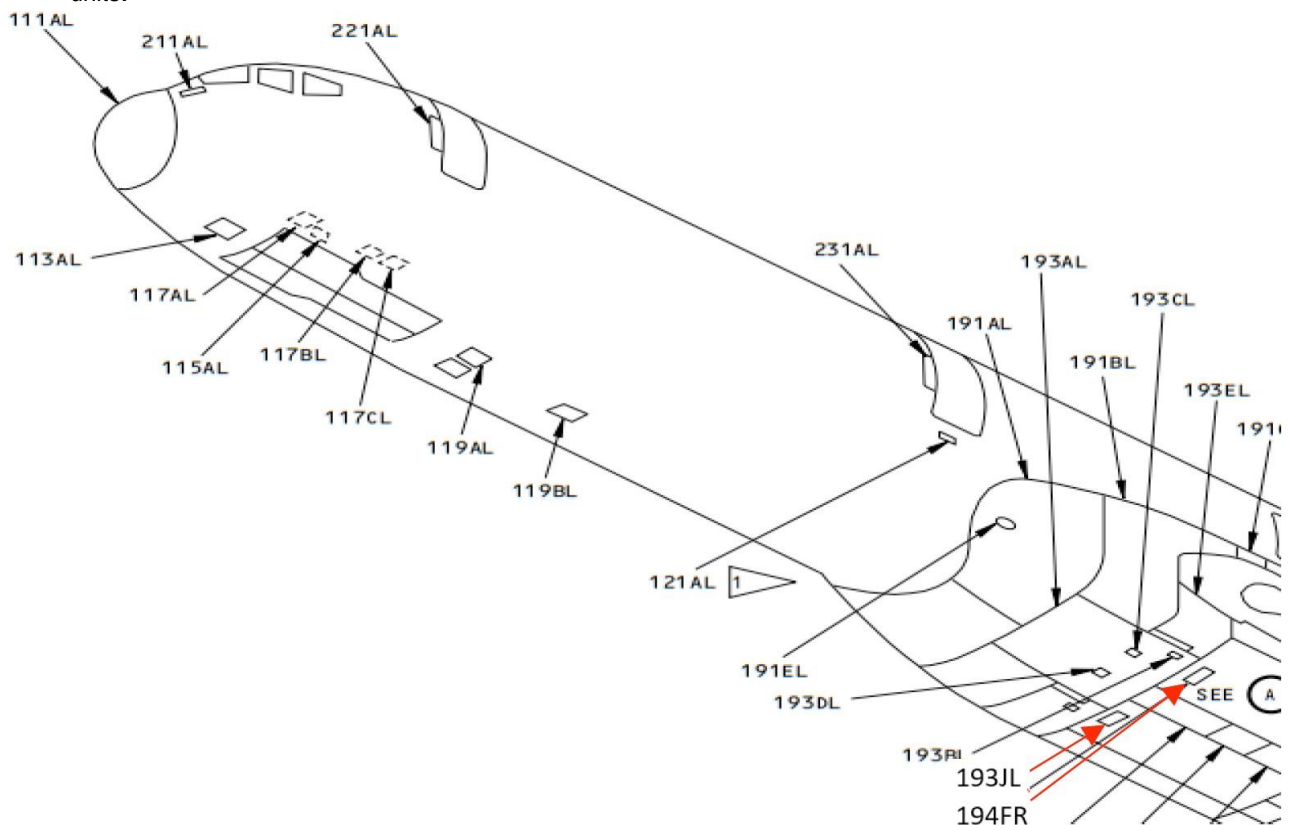


Figure 50. Access panel for ASU flange connections.

ATTENTION!

Once an external air start unit is connected, air will be supplied to all aircraft systems. To prevent the system from being powered up and activated, isolate the system before powering up.

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When connecting any external air start unit, the following sequence must be observed: first connect the external GPU and then connect the ASU, act in the reverse order when disconnecting.

4.6.22.3 Position the ASU out of the handling and engine start area.

4.6.22.4 Connect the GPU to the aircraft (AMM PAGEBLOCK 24-22- 00/201).

4.6.22.5 Connect the unit to the aircraft flange connection, start the ASU but do not exceed the pressure of 45 PSIG.

ATTENTION!

Exceeding the 45 PSIG pressure may cause damage to the equipment or injury to the personnel. If this pressure is insufficient, connect the second unit.

4.6.22.6 If the air supply is required for all systems and the connection is only on the left or only on the right, close the Isolation VLV / button on overhead (ceiling) panel P5. Make sure that the white indicator lamp turns on. Check that the VALVE light turns on and then goes down.

4.6.22.7 Look at the BLEED AIR DUAL DUCT PRESS indicator on panel P5 and check that the L and/or R indicator(s) show positive pressure. The observed pressure indication will depend on the ground source of system load.

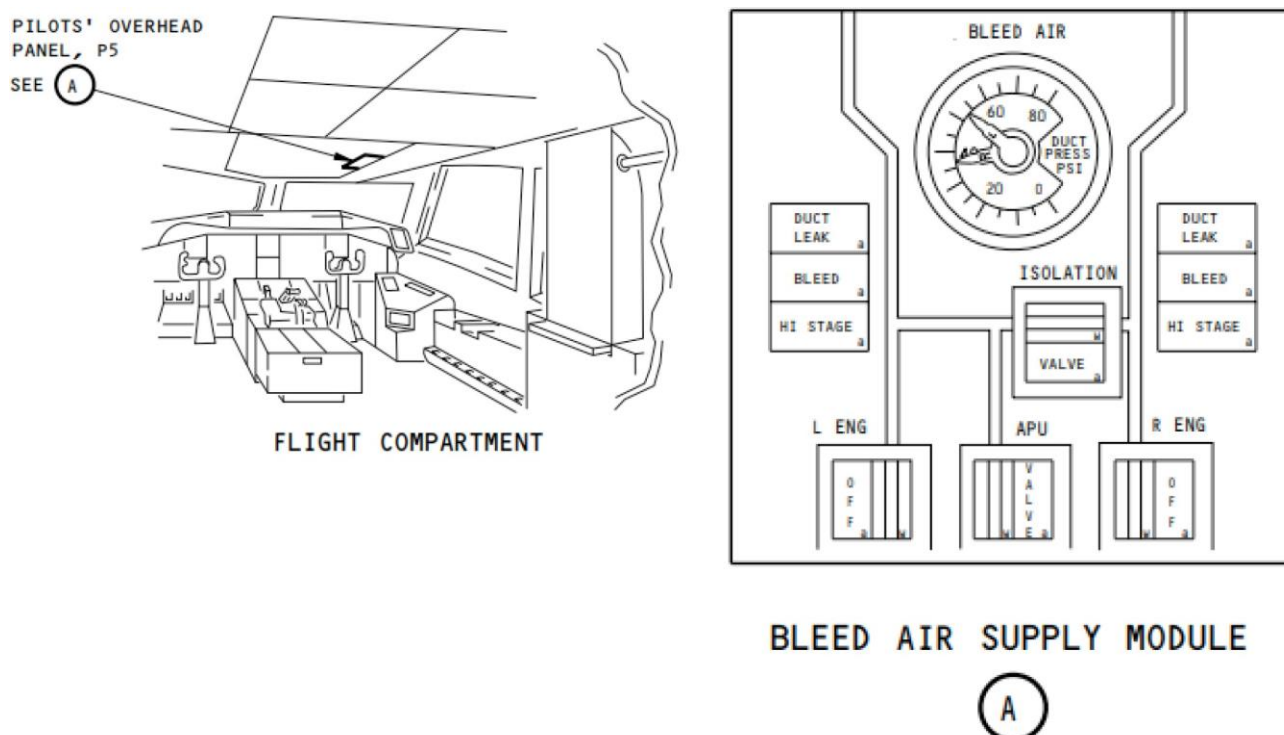



Figure 51. Bleed Air Supply Module.

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4.6.22.8 ASU specifications for Boeing 757

Reference	Description
COM-2475	Unit - Air Start, 250 Lbs./Min. at 42 PSIG, Trailer Mounted, Two Outlets Part #: ACE-500 SERIES Supplier: 6L481 Part #: ASP180 Supplier: 12867 Part #: ASP250 Supplier: 12867 Part #: ASP2500 Supplier: 12867 Part #: ASP300 Supplier: 12867 Part #: ASU-400-S Supplier: \$0552 Part #: ASU-600-400 Supplier: 6L481 Part #: MSU-400 SERIES Supplier: D9448 Part #: PSC3000 Supplier: 12867 Part #: TMD-150 Supplier: 4TVG2 Part #: TMD-250 Supplier: 4TVG2 Part #: TMD-400 Supplier: 4TVG2 Opt Part #: PSC1800 Supplier: 0B9A3 Opt Part #: PSC3000 Supplier: 0B9A3 Opt Part #: TMAC-250 Supplier: 4TVG2 Opt Part #: TMAC-375 Supplier: 81381

4.6.23 Connection of an external air heater / conditioner.

4.6.23.1 When using the Unified Motor Heater UMP-350.

4.6.23.1.1 Ground the aircraft.

4.6.23.1.2 Set the outflow valve to the OPEN position.

4.6.23.1.3 Open the 193DL Conditioned Air Ground Service access panel.

4.6.23.1.4 Connect one heating hose to the 193DL air conditioning panel.

4.6.23.1.5 Open the 119BL Main Equipment Centre access panel.

4.6.23.1.6 Connect two heating hoses to MEC through the 119BL access panel.

4.6.23.1.7 Open the 113AL access panel.

4.6.23.1.8 Insert one heating hose into the equipment fwd compartment through the 113AL access panel.

4.6.23.1.9 Maintain the required cockpit temperature 30 minutes prior to turning off the heating equipment.

ATTENTION!

The air supplied by the heater must not exceed 158°F (70°C)

4.6.23.2 When using Herman Nelson heater

4.6.23.2.1 Ground the aircraft.

4.6.23.2.2 Open the 193DL Conditioned Air Ground Service access panel.

4.6.23.2.3 Connect the heating hose to the 193 DL ground air conditioning panel.

4.6.23.2.4 Open the 119BL Main Equipment Centre access panel

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4.6.23.2.5 Connect the heating hose to MEC through the 119BL access panel.

4.6.23.2.6 Maintain the required cockpit temperature 30 minutes prior to turning off the heating equipment.

4.6.23.3 Heater disconnection procedure.

4.6.23.3.1 Disconnect the grounding.

4.6.23.3.2 Disconnect the heating hose from the 193 DL Conditioned Air Ground Service access panel.

4.6.23.3.3 Disconnect the heating hoses from the 119BL Main Equipment Centre access panel.

4.6.23.3.4 Disconnect the heating hose from the 113AL fwd compartment access panel.

4.6.23.3.5 Make sure that 193DL, 119BL and 113AL access panels are closed.

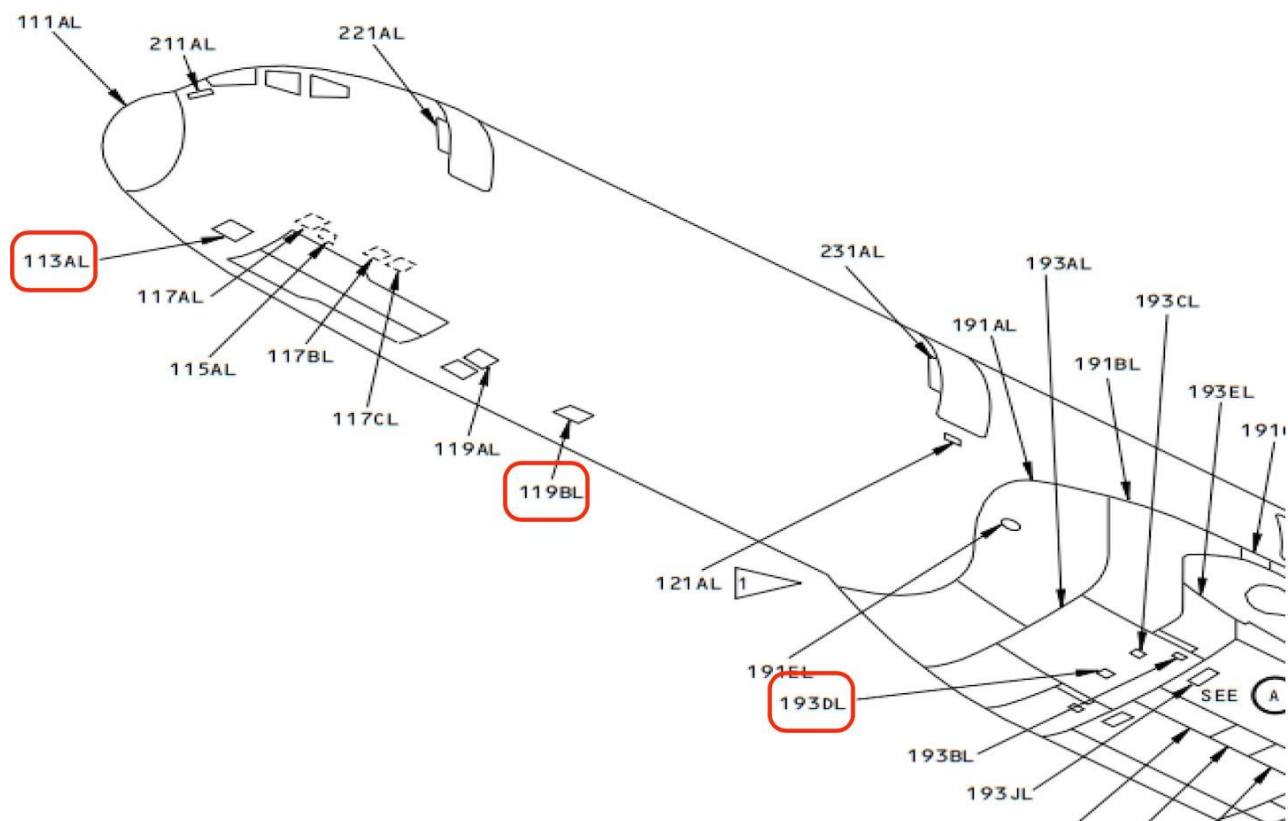



Figure 52. Access panels for heater connection.

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4.6.24 APU start

4.6.24.1 Use the APU Operation Limits table during startup and operation of the APU. If the APU parameters exceed the limits in the table, turn off the APU immediately, otherwise you may damage the APU.

Condition	Operation Mode	Limit
Temperatures:		
Compressor Inlet	Any Operation Mode	54°C (130°F) maximum
Oil Temperature	Any Operation Mode Overtemperature Shutdown	135°C (275°F) maximum 152°C (305°F)
Fuel Temperature	Any Operation Mode	-54°C (-65°F) to 49°C (120°F)
Oil Consumption:	Any Operation Mode	Ref Figure 201.
Oil/Fuel Leakage:	Any Operation Mode	PAGEBLOCK 49-16-00/601
Air Leakage:	Any Operation Mode	Air leakage is permitted at the fuel nozzle. Air leakage is also permitted at the circumferential seal for the turbine heat shield if the air leakage is not pointed at the ignition unit. Air leakage at the circumferential seal, pointed at the ignition unit, is permitted if SB GTCP331-49-7119 is incorporated. SB GTCP331-49-7119 replaces the ignition exciter insulator to protect the ignition exciter from damage. Air pressure from the heat shield can cause high airflow out of the drain mast during usual operation.
Oil Pressure: At the Gearbox	Continuous Operation Low Oil Pressure Shutdown	65 ± 5 psig 35 ± 5 psig
Fuel Pressure: Inlet Pressure	Any Operation Mode	10 to 55 psig

Condition	Operation Mode	Limit
Starter Duty Cycle:	Starter Operation	Three tries to start (maximum) followed by 60 minutes to let the temperature of the starter decrease.
Operating Ranges or Limits for the Auxiliary Power Unit - Conditions That Are Seen on the EICAS Maintenance Page:		
Exhaust Gas Temperature:	Main Engine Start (MES) Mode	471°C (880°F) to 571°C (1060°F) max
	Environmental Control System (ECS) Mode	343°C (650°F) to 538°C (1000°F)
	Maximum Operation Limit	581°C (1078°F) to 588°C (1090°F)
Engine Speed:	Continuous Operation in MES Mode	101%
	Continuous Operation in ECS Mode	99%
	Overspeed Shutdown	107%
	Backup Overspeed Shutdown	109%

4.6.24.2 Do not start the APU while refueling the APU.

4.6.24.3 Make sure the APU compartment access doors are closed.

4.6.24.4 Read AMM 49-11-00 before commencing the startup procedure.

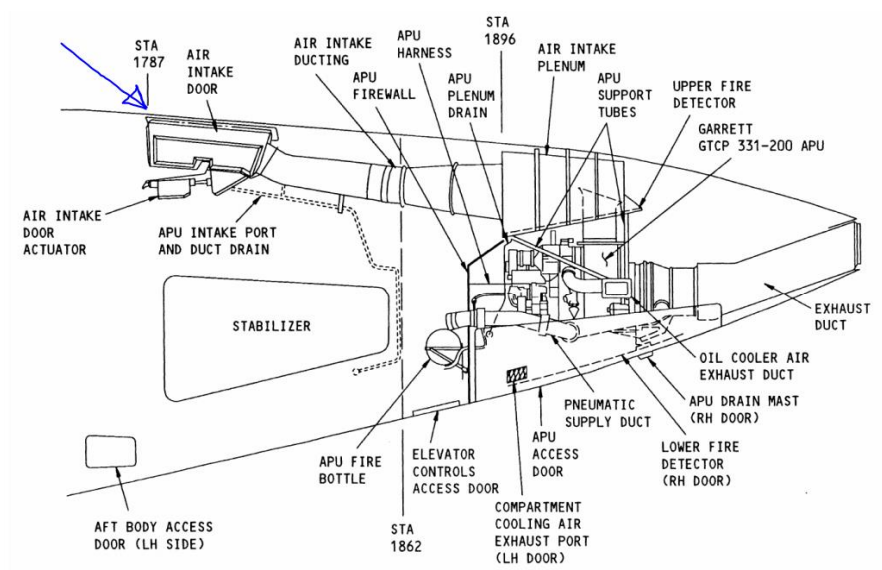


Figure 53. Location of ASU Air Intake.

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4.6.24.5 Make sure there are no foreign object debris in the APU air intake area.

4.6.24.6 Make sure that the following circuit breakers are closed (switched on):

Main Power Distribution Panel, P6

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
E	3	C01063	APU FUEL VALVES
G	1	C00780	FIRE EXT APU
H	23	C00372	L FWD FUEL BOOST PUMP

Overhead Circuit Breaker Panel, P11

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	35	C01306	IND LIGHTS 4
B	16	C00567	AURAL WARN SPKR L
B	18	C00566	WARN ELEX B
B	24	C00776	FIRE DETECTION APU 1
B	25	C00785	FIRE DETECTION APU 2
B	33	C00796	APU REMOTE FIRE IND
B	34	C01390	APU ALTN CONT
C	33	C01058	FUEL DC PUMP APU
D	35	C01052	FUEL DC PUMP CONT
H	35	C00568	AURAL WARN SPKR R
J	25	C00765	FIRE DET ALTN PWR APU
J	33	C00565	WARN ELEX A
P	28	C01273	R IND LTS 1
Q	22	C01336	APU BLEED PWR
Q	23	C01333	APU BLEED CONT

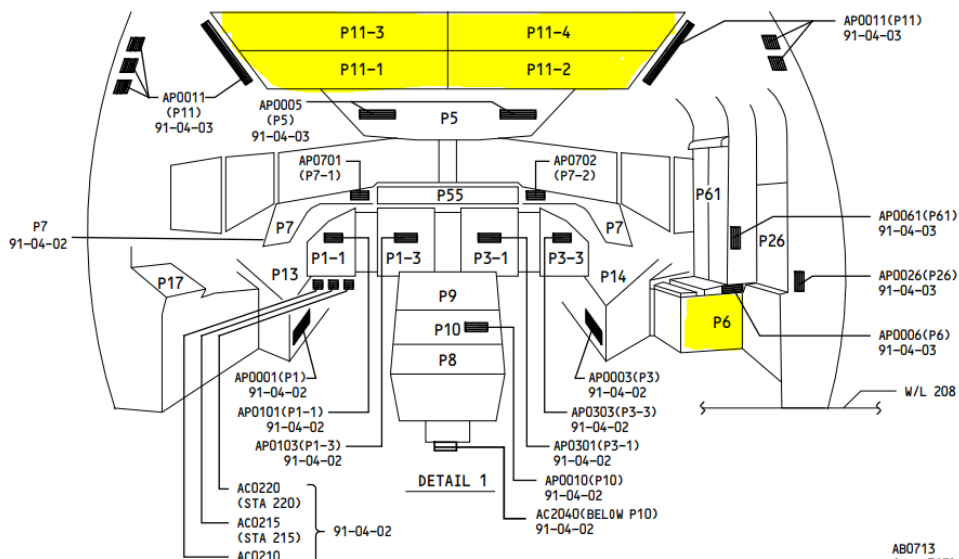


Figure 54. Panels P5, P6, P11, P61.

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4.6.24.7 Set the switches:

- MAIN BATTERY SWITCH to the ON, STBY POWER position – to AUTO.

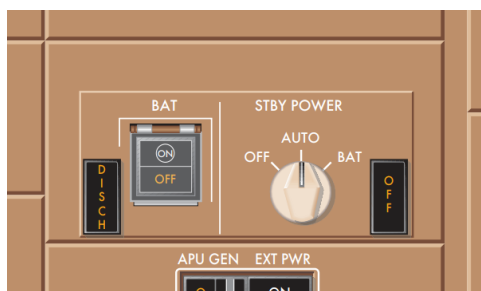


Figure 55. MAIN BATTERY SWITCH.

- APU BLEED AIR VALVE to the OFF position.

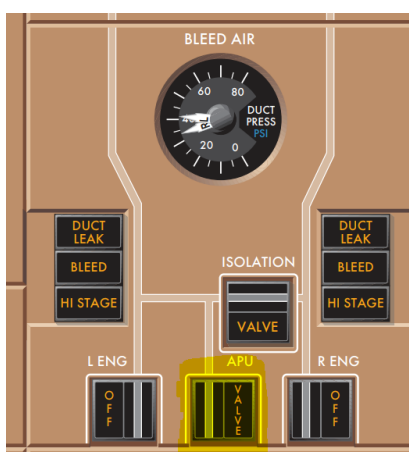


Figure 56. APU BLEED AIR VALVE SWITCH.

4.6.24.8 Perform the APU fire protection system test:

- Press and hold the ENG/APU/CARGO button on the FIRE/OVHT TEST panel located on the center stand of P8



Figure 57. FIRE/OVHT TEST SWITCH.

- The main EICAS display shall show APU FIRE advisory message, and the STATUS and MAINTENANCE display shall show APU FIRE LP1, APU FIRE LP2 advisory message.
- Make sure that the fire alarm in the cockpit and on the nose landing gear strut is activated.

- Make sure the red light in the APU FIRE HANDLE has lit up

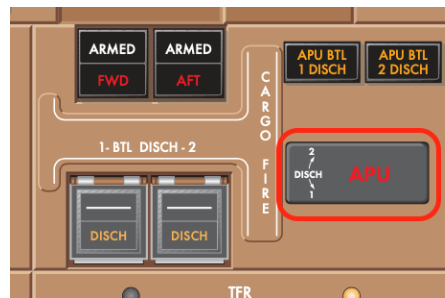


Figure 58. APU FIRE HANDLE.

- Make sure that all indicator lamps which lit up during previous steps have gone down. This means the test has been completed.

4.6.24.9 Perform the fire squib test by following the steps below:

- Make sure that the following circuit breaker is closed (switched on):

Main Power Distribution Panel, P6

Row	Col	Number	Name
H	1	C00778	BTL 1 ENG L FIRE EXTINGUISHING

- Press and hold the green TEST button on P61 panel (to the right of the co-pilot)

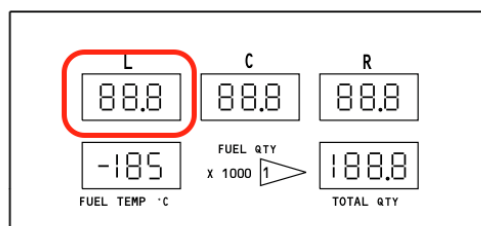


Figure 59. SQUIB TEST PANEL (P61).

- Make sure the APU green light has lit up.
- Release the TEST button.
- Make sure the APU green light has gone down.

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4.6.24.10 Make sure that the amount of fuel in the left wing tank is at least 500 kg. The fuel quantity indicator is located on the P5 panel.



4.6.24.11 The APU may only be started and operated when all steps of 4.13.25.1 through 4.13.25.10 have been completed.

4.6.24.12 Set the APU start switch to the START position, hold it for 1 second, then turn it to the ON position.



Figure 60. SQUIB TEST PANEL (P61).

4.6.24.13 Make sure the RUN lamp has twice lit up and gone down.

4.6.24.14 Make sure the FAULT lamp has twice lit up and gone down. Убедитесь, что лампа загорелась и погасла.

4.6.24.15 After the APU enters the mode, the RUN lamp will light up.

4.6.24.16 In case of abnormal APU parameters exceeding the limits, the APU will automatically shut down and the FAULT lamp will light up. In this case:

- Set the APU start switch to the OFF position, and wait for 1 minute.
- Repeat all steps starting with 4.13.25.12
- In case of a repeated failure to start the APU, do not make further attempts to start the APU.

4.6.25 Supply of 115V power from APU.

- Set the APU GEN switch to the ON position.
- Set both BUS TIE switches to the AUTO position.
- Make sure the yellow ISLN lamps in the BUS TIE switches are off.

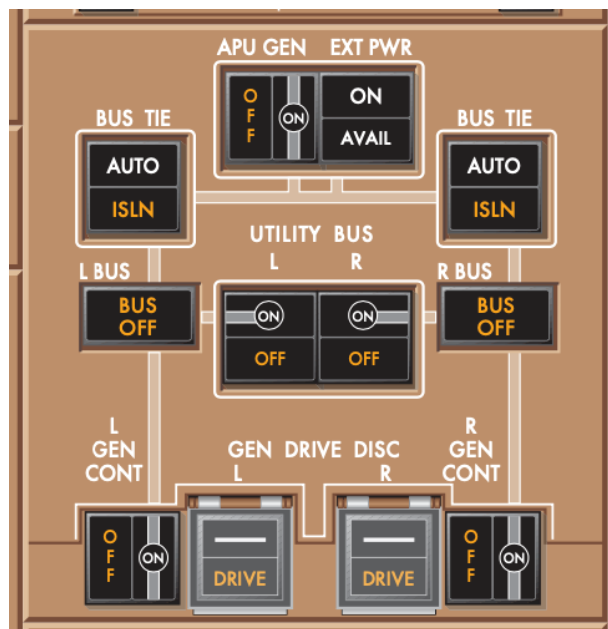


Figure 61. ELECTRIC CONTROL PANEL (P5 panel).

4.6.26 Switching on the air bleed from APU and Air Conditioning System (ACS)

- Set the APU BLEED AIR switch to the ON position (Figure 56). Make sure the white bar has appeared on the switch and the VALVE lamp has lit up and gone down.
- Set the left PACK switch on P5 panel to AUTO.

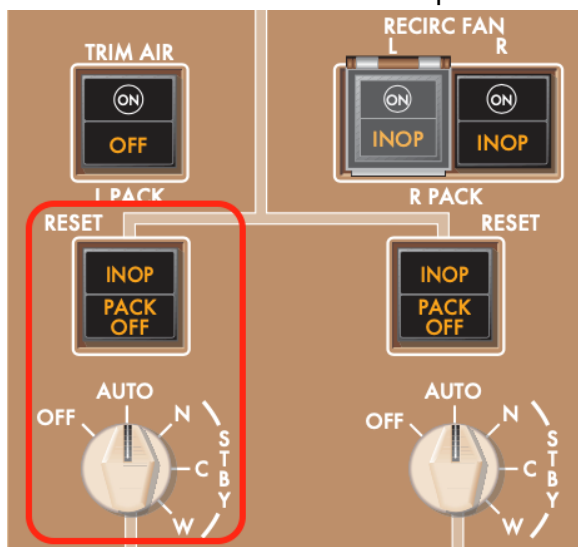



Figure 62. AIR CONDITIONING PANEL (P5 panel).

- Make sure the PACK OFF lamp has gone down.

4.6.27 Switching off the APU

- Set the left PACK switch on P5 panel to the OFF position (Figure 60).
- Set the APU BLEED AIR switch to the OFF position (Figure 56).
- Set the APU start switch to the OFF position (Figure 58)
- Allow the APU to shut down (this may take from one to three minutes)
- Set the STBY POWER switch to the OFF position (Figure 55)

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- Set the MAIN BATTERY SWITCH switch to the OFF position (Figure 55)

4.6.28 APU emergency shutdown

- Emergency shutdown of the APU is used in case of fire in the APU compartment.
- Emergency shutdown of the APU can be accomplished in two ways: from the cockpit and from P62 panel at the nose landing gear.
- In case of the APU emergency shutdown, report the details and causes of the event to the technical personnel or the aircraft flight crew.
- Emergency shutdown of the APU from the cockpit.
- Pull up the APU FIRE HANDLE (Figure 57).
- If the fire alarm continues and a fire is visually confirmed in the APU compartment, turn the handle to discharge the fire-extinguisher bottle.

ATTENTION!

Do not turn the fire extinguishing handle unless you are sure there is a fire in the APU compartment. When you turn the handle, the fire-extinguisher bottle will discharge.

- When the APU shuts down, set the APU start switch to the OFF position (Figure 60)
- Emergency shutdown of the APU from P62 panel at the nose landing gear.
- Press the APU SHUTDOWN switch on P62. The red ARM lamp will light up, indicating that the fire-extinguisher bottle is ready to be discharged
- If the fire alarm continues and a fire is visually confirmed in the APU compartment, press the APU BOTTLE DISCHARGE button.

ATTENTION!

Do not press the APU BOTTLE DISCHARGE button unless you are sure there is a fire in the APU compartment. When you press the button, the fire-extinguisher bottle will discharge.

- When the APU shuts down, set the APU start switch to the OFF position (Figure 60)
- Set the MAIN BATTERY SWITCH switch to the OFF position (Figure 55)

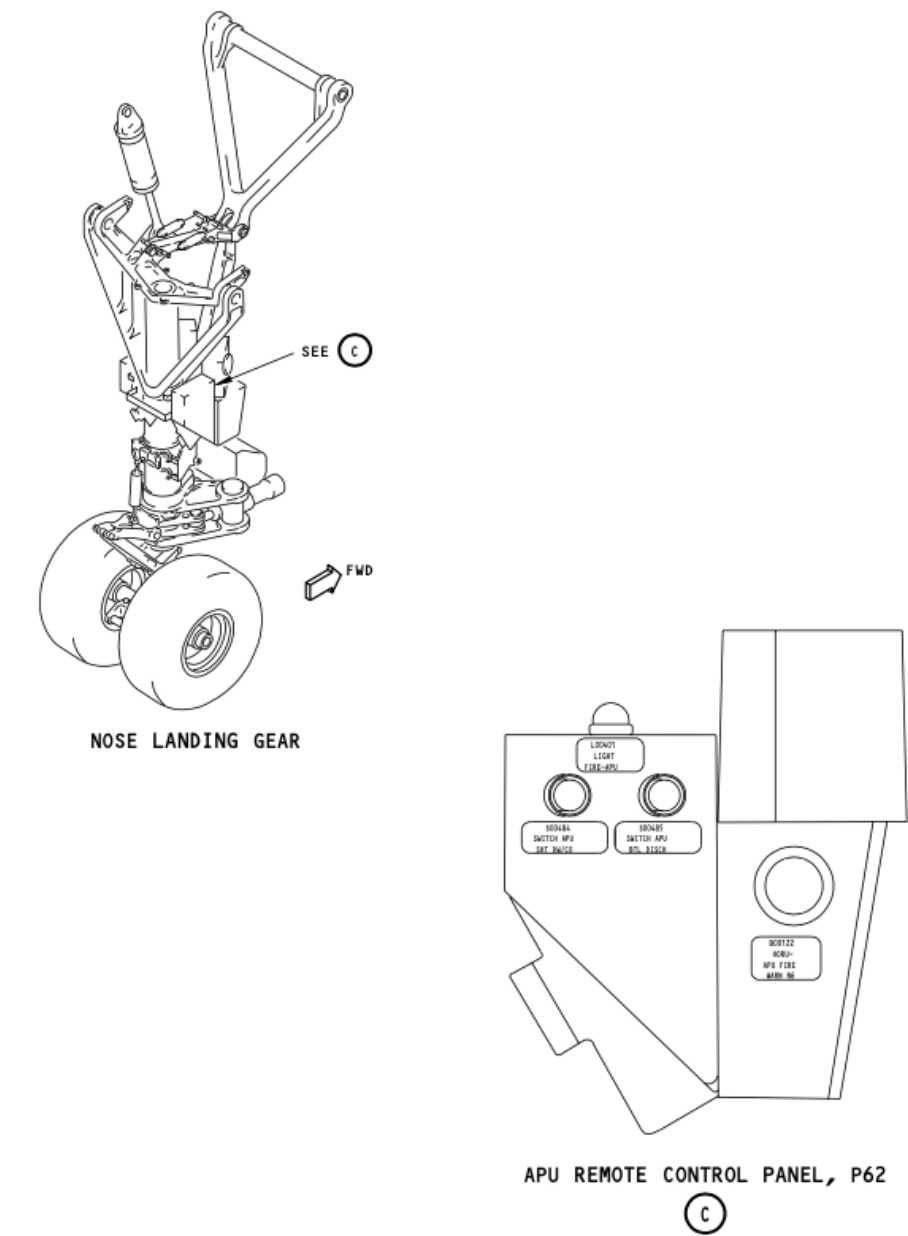




Figure 63. APU REMOTE CONTROL PANEL (P62 panel).

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4.7 Aircraft de-icing procedure


- 4.7.1 Aviacompany “Aviastar-TU” LLC employs an approach to aircraft de-icing known as the “Clean Aircraft Concept”. When conducting aircraft ground handling operations under the conditions conducive to icing, the aircraft departure is prohibited if any ice, snow, slush or frost is present or sticking on wings, control surfaces, engine air intakes or other critical surfaces.
- 4.7.2 Deposits of ice, frost or snow on the leading edge and upper surface of the wing with a thickness and roughness resembling medium or coarse sandpaper can reduce the wing lift by 30% and increase the drag by 40%. These changes in lift and drag significantly increase stall speed, impair controllability, and affect aircraft performance. Deposits on aircraft surfaces are especially dangerous for aircraft take-off and landing modes in which large wing angles of attack are employed.
- 4.7.3 The factors that contribute to accumulation of freezing precipitation and fuel icing are the:
- ambient air temperature;
 - relative humidity;
 - type and intensity of precipitation;
 - type and density of fog;
 - thermal radiation;
 - wind speed and direction;
 - aircraft surface temperature (including the temperature of fuel in the wing tanks);
 - availability of the de-icing fluid;
 - type and temperature of the de-icing fluid;
 - aqueous solution of the de-icing/anti-icing fluid (concentration);
 - procedure for application of the de-icing fluid (de-icing treatment procedure);
 - period of time elapsed after the de-icing (holdover time);
 - close proximity to the jet stream of another aircraft, equipment, and facilities;
 - operation on surfaces covered with snow, slush and moisture;
 - slope angle, contours and roughness of the aircraft surface;
 - conditions of the aircraft parking (outside the hangar, partially or completely in the hangar).
- 4.7.4 In accordance with the generally accepted approach to aircraft treatment, the responsibility for ensuring the aircraft compliance with the Clean Aircraft Concept lies with both the flight crew (pilot-in-command) and the ground handling personnel preparing the aircraft for the flight.
- 4.7.5 The pilot-in-command shall be responsible for:
- the correctness of checking for snow and ice deposits (with regard to the necessity for aircraft treatment) and deciding whether to carry out the aircraft de-icing treatment;
 - the compliance of aircraft critical surfaces with the Clean Aircraft Concept prior to departure and the decision to departure under these conditions;
 - proper aircraft configuration before starting the aircraft de-icing treatment in accordance with the aircraft operation and technical documentation;
 - receipt of the de-icing code and information on the results of the de-icing treatment;
 - correctness of the decision to refuse from the aircraft de-icing treatment.

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ATTENTION!

The pilot-in-command is prohibited from deciding to departure without the aircraft de-icing treatment if the departure coordinator has reported on the presence of snow and ice deposits (SID) on the aircraft critical surfaces.

- 4.7.6 Any aircraft de-icing operations shall be carried out by the personnel specially trained to treat aircraft against ground icing and authorized to perform this type of work on aircraft de-icing treatment.
- 4.7.7 The personnel carrying out aircraft de-icing treatment shall be responsible for the:
 - compliance of the aircraft de-icing operations with the chosen procedure, in full and with the required quality;
 - concentration and temperature of the de-icing fluid used for treatment;
 - cleanliness of the aircraft surfaces after SID removal procedures;
 - safe execution of all operations when carrying out aircraft de-icing treatment;
 - completeness and accuracy of the information provided to the departure coordinator;
 - timely and proper execution of documents.
- 4.7.8 If the de-icing quality check is assigned to the de-icing operator, he or she shall be responsible for the completeness and quality of such check and for recording the de-icing code.
- 4.7.9 Various methods of aircraft ground de-icing have been developed. The most common method is the use of Freezing Point Depressant (FPD) de-icing fluids to remove and prevent icing on the ground and create a protective anti-icing film which can slow down the formation of ice, snow or frost on the aircraft surface.
- 4.7.10 Proper de-icing followed by treatment with an appropriate anti-icing fluid provides the best protection against contamination.
- 4.7.11 The primary function of all de-icing fluids is to lower the freezing point of freezing precipitation that enters the aircraft and thus prevent the accumulation of ice, snow, slush, or frost on critical surfaces. De-icing fluids are classified as Type I, II, III and IV fluids.
- 4.7.12 Type I fluids have a relatively low viscosity, which varies with temperature.
- 4.7.13 Type II, III and IV fluids contain thickeners and therefore have a higher viscosity which varies with shear force, fluid-water ratio, and fluid temperature.
- 4.7.14 Type II fluids have better de-icing properties than Type I fluids.
- 4.7.15 There are many factors that affect the efficiency and holdover time of the de-icing fluids. For this reason, it is not possible to determine the exact holdover time for a particular de-icing fluid.
- 4.7.16 This Manual contains tables which summarize the rules of application of different types of fluids and the estimated holdover time (HOT) for different types of de-icing fluid mixtures depending on the weather conditions and ambient air temperature.
- 4.7.17 In many cases, regular de-icing and anti-icing procedures may be ineffective in providing the necessary protection to proceed with the flight. This can occur in freezing rain, freezing drizzle, heavy snowfall, or any other condition where the freezing precipitation contains large amounts of water. At very low ambient temperatures (below about -30°) some Type I heated fluids are no longer effective and therefore other de-icing methods must be used.

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4.7.18 Visual or physical inspection of the aircraft critical surfaces should be done to check the treatment efficiency and compliance with the Clean Aircraft Concept.

4.7.19 Holdover time.

4.7.19.1 Holdover time (HOT) is the estimated time during which the de-icing fluid will prevent ice and frost formation and snow accumulation on the protected (treated) aircraft surfaces. The holdover time is counted from the beginning of the last de-icing treatment and ends after a period of time equal to the corresponding holdover time. If necessary, the aircraft de-icing should be repeated.

4.7.19.2 When the aircraft is on the ground, the ETD duty shift or engineering and technical personnel of the crew, or the aircraft crew of Aviacompany "Aviastar-TU" should take all measures to protect the aircraft from icing and snow penetration into the internal cavities of the airframe, engines and avionics by timely installation of plugs, covers and other devices provided by the aircraft operational documentation, and remove the snow and ice deposits before departure, if any.

4.7.20 Removal of snow and ice deposits from the aircraft surfaces

4.7.20.1 Methods and equipment to remove deposits from the aircraft.

4.7.20.1.1 Snow and ice deposits are removed by the following methods:

- dry snow and frost are removed with hair brushes;
- rime ice and frozen snow are removed mechanically by brushes followed by treatment with the de-icing fluid;
- at the final stage, surface treatment with the anti-icing fluid of a specified concentration is mandatory taking into account the ambient air temperature, wind speed and precipitation.


4.7.20.1.2 Aircraft de-icing should be done prior to departure and/or when the aircraft reaches the runway for take-off so that there is a minimum interval between the de-icing treatment and the take-off which saves the holdover time.

4.7.20.1.3 The de-icing treatment can be accomplished in one step using heated de-icing fluid for both de-icing and anti-icing, or in two steps using heated de-icing fluid or hot water to remove ice, followed immediately by application of the anti-icing fluid. All temperature and pressure restrictions must be observed. The choice of one-step or two-step treatment depends on the situation on site, i.e., winter weather conditions, available equipment and fluids, and the duration of holdover time.

4.7.20.1.4 Aircraft can be treated with the de-icing fluids specified in the list of de-icing fluids approved for application to protect aircraft from ground icing during the winter season approved by the Federal State Unitary Enterprise "State Research and Development Institute of Civil Aviation".

4.7.20.1.5 When carrying out a two-step de-icing treatment, the second step should be started no later than 3 minutes after the beginning of the first step in order to avoid freezing of the fluid used in the first step. If this 3-minute interval is exceeded, the two-step de-icing should be repeated. If it is difficult to maintain the 3-minute interval during the de-icing process at sub-zero temperatures, it is recommended to carry out de-icing over portions of the aircraft surface. The holdover time is counted from the first contact of the anti-icing fluid used for the second step of treatment with the aircraft surface. The temperature of the unheated anti-icing fluid (solution) for the second step or the method of its application must be such as to prevent the fluid used for the first step from freezing. The unheated fluid may be used for anti-icing of clean aircraft.

4.7.20.1.6 The amount of fluid (de-icing fluid or its aqueous solution) used for removal of snow and ice deposits (SID) should be sufficient to completely clean the aircraft entire surface covered with

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SID. The approximate minimum fluid consumption is 1 litre per square meter of aircraft surface.

4.7.20.1.7 The fluid consumption depends on the:

- total mass of SID on the aircraft and mass of SID frozen to the aircraft skin;
- equipment used to apply the fluid to the aircraft surface;
- qualification of the operator carrying out the aircraft de-icing treatment.

4.7.20.1.8 Application of the fluid protective layer in a two-step treatment after the removal of SID should be done in such a way as to completely cover (displace) the fluid layer used in the first step and create a new continuous protective fluid layer. An insufficient amount of fluid in the second step of the two-step treatment can significantly reduce the anti-icing fluid holdover time.

4.7.20.1.9 According to the publications of the Association of European Airlines (AEA), the recommended minimum consumption of the anti-icing fluid (solution) (second step of the two-step treatment) shall be 1.3 - 1.6l per square meter of the aircraft treated surfaces.

ATTENTION!

The aircraft surfaces after de-icing should be wet, smooth, shiny without clouding, crystals and lumps. An insufficient amount of fluid leads to the:

- reduction in the quality of aircraft surface treatment (cleaning) from SID;
- reduction in the holdover time.

4.7.20.2 Aircraft de-icing procedure

4.7.20.2.1 The decision to de-ice the aircraft prior to departure is made by the aircraft pilot-in-command who has full authority to decide whether or not the de-icing procedures are to be implemented when he deems it necessary.


4.7.20.2.2 4.14.20.2.2 The aircraft pre-departure de-icing treatment is carried out by the engineering and maintenance personnel of Aviacompany "Aviastar-TU" and the airport service provider in accordance with the relevant contract.

4.7.20.2.3 At ambient air temperature +5°C and below, the engineer in charge of preparing the aircraft for departure must inspect the aircraft and arrange for the aircraft de-icing in case of any snow and ice deposits on the surfaces of stabilizer, wing, fuselage, in the slots of rudders, ailerons, flaps and slats, as well as on external aerals, pitot-static probes, drainage nozzles, units and parts of the landing gear.

4.7.20.2.4 The start time of the inspection is determined in accordance with the technological schedule of aircraft preparation for departure and can be from 3 to 12 hours prior to the scheduled time of departure.

4.7.20.2.5 Make sure that the plugs and covers on the pitot probes and static ports are installed before carrying out any work at the parking stand.


4.7.20.2.6 Communication between the ground personnel and flight crews is an integral part of the de-icing process and should be provided for all de-icing procedures. Before start of the de-icing process, the ground personnel instruct the crew to turn off the air conditioning system and the air bleed from the APU. Once the de-icing is completed and the aircraft is appropriately inspected, the information on the completion of the last step of the de-icing/anti-icing process

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is communicated to the flight crew to confirm that the aircraft complies with the Clean Aircraft Concept: this information is provided in the form of a de-icing code.

4.7.20.2.7 The de-icing fluids are applied close to the aircraft skin in order to minimize the heat loss. Special methods may be required, depending on the aircraft design. Fluid spraying generally starts from the fuselage. The following is a description of the regular treatment methods:

- the fuselage. The fluid is applied along the centreline of its upper part and then to the side surfaces. Any direct contact with the cockpit and cabin windows should be avoided;
- the wings and horizontal empennage. The fluid is sprayed from the leading edge of the wing toward the trailing edge and from the highest point of the convex surface to its lowest point. Other procedures may be used, depending on the local conditions and aircraft configuration;
- the vertical surfaces. The fluid is applied from top to bottom: from the leading edge toward the trailing edge;
- the landing gear and wheel bays. Application of the de-icing fluid in these areas should be minimal. The use of a high-pressure jet is not recommended. Never apply the fluid directly to the brakes and wheels;
- the engines / APU. Do not allow the fluid to enter the engines or the APU. Before starting the engines, make sure that the rotors rotate freely and that the front and rear sides of the fan blades are free of ice. During the de-icing procedure with the engines or APU running, the air conditioning systems must be switched off. It is prohibited to apply fluid directly to the exhaust nozzles and thrust reversers;
- it is necessary to avoid the direct contact of fluid with the pitot probes, static ports and their wind and angle-of-attack transducers;
- removal of a thick layer of snow is carried out by the technical personnel of the line maintenance shop with the help of plywood hairbrushes, brooms, tarpaulin tracks or blowing with hot air, after which, if necessary, the de-icing fluid is applied. After removal of the snow and ice deposits, it is necessary to check the absence of ice in the slot gaps of control effectors and high-lift devices, and make sure that the control effectors and high-lift devices freely deflect to their extreme positions;
- at sub-zero ambient temperatures, with no snow and ice deposits on the aircraft surfaces and subject to no conditions conducive to their formation, the engineer in charge of preparing the aircraft for departure and the aircraft pilot-in-command may take an agreed decision on the absence of necessity for the aircraft de-icing, of which a record is made in the aircraft logbook;
- ☐ if the de-icing is necessary, the engineer in charge of preparing the aircraft for departure orders a special-purpose vehicle for the time specified in the technological schedule, and in case of any significant snow and ice deposits - also for the preliminary (at least 3 hours prior to departure) treatment of the aircraft. In accordance with the contract, the service provider ensures the arrival of special-purpose vehicles for the aircraft preliminary treatment at the designated time, and for regular treatment - no later than 15 minutes before the aircraft departure. The aircraft de-icing is carried out after the aircraft loading at the designated (for treatment) site and before starting the engines for taxiing for departure;
- before starting the treatment, the engineer in charge of preparing the aircraft for departure, checks the certificate of the de-icing fluid in the special-purpose vehicle for its compliance with the established requirements and actual weather. The engineer in charge of preparing the aircraft for departure, personally supervises the aircraft treatment, after which he checks the cleanliness of the treated aircraft surfaces visually and by touch. The service provider personnel do not leave the site

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of the aircraft treatment without permission of the engineer in charge of preparing the aircraft for departure;

- upon completion of the aircraft treatment, the service provider personnel and the engineer in charge of preparing the aircraft for departure fill in the “Contractor” and “Control” fields of the de-icing check list in two copies respectively, and the engineer receives the data card with relevant data on the type (I or II) and concentration of the de-icing fluid, date and time of the de-icing treatment start and completion. The data card shall be attached to the work order.

4.7.20.2.8 The flight crew is provided with the de-icing codes, which must be recorded and contain information in the following sequence:

- **Item A:** indicates the type of fluid used, for example “Type I”, “Type II”, “Type III” or “Type IV”;
- **Item B:** indicates percentage of the de-icing fluid in the fluid/water mixture, for example “100” for 100% fluid, “75” for a mixture of 75% fluid and 25% water (it is not necessary to indicate this for Type I fluid);
- **Item C:** indicates the local time (hours and minutes) of the last de-icing/anti-icing step commencement, for example “1:30 p.m.”;
- **Item D:** indicates the date, month and year, for example “March 20, 2012” (this is only necessary for the purposes of recording; it is unnecessary when providing information to the crews).

4.7.20.2.9 Provision of items A and B data to the aircraft crew confirms that the de-icing treatment is complete, and the aircraft is clean.

4.7.20.2.10 After completion of the aircraft treatment, the crew, upon information from the engineer in charge of preparing the aircraft for departure, makes an entry in the aircraft logbook: “De-icing treatment carried out, type (I or II) and concentration of the de-icing fluid, date and time of the aircraft de-icing treatment start and completion, name of the engineer in charge of preparing the aircraft for departure”.

4.7.20.2.11 In case of any take-off delay exceeding the Holdover time, the aircraft pilot-in-command should arrange for the aircraft inspection and, based on its results, decide whether a repeated treatment is necessary.

4.7.20.2.12 If a decision on a repeated treatment is made, the aircraft pilot-in-command informs the ATC authority thereof and advises of the type of fluid with which the aircraft has been originally treated. The repeated treatment is carried out after removal of the previously applied fluid with the same type of fluid. It should be considered that the repeated use of Type II or Type IV fluids without previous use of Type I fluid or hot water can cause residues to accumulate on aerodynamically calm surfaces. At certain temperatures, high humidity and/or rain conditions, these deposits may re-hydrate and freeze. It may also block or

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interfere with the regular operation of critical flight control systems and may require operations to remove these residues.

4.7.21 Specific aspects of B757-200PCF aircraft de-icing

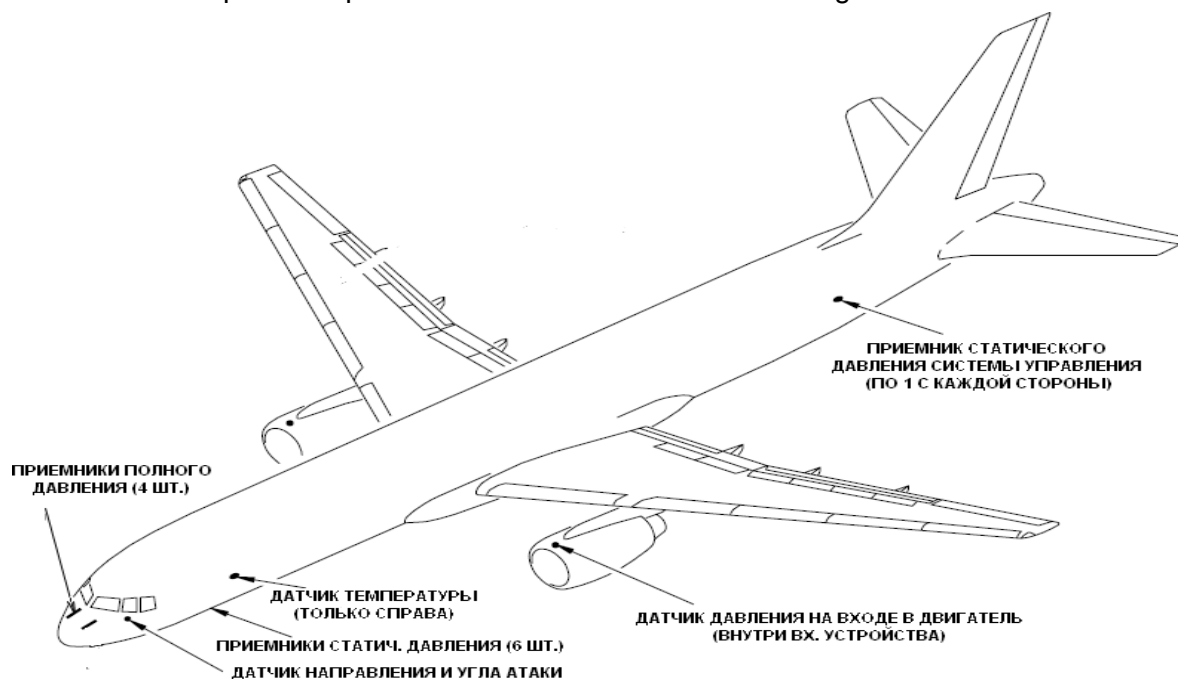



Figure 64. Location of pitot probes, static ports and sensors/probes/transducers.

4.7.21.1 During the de-icing operations, it is prohibited to direct the fluid jet at the:

- engine or APU intake duct;
- engine exhaust;
- engine thrust reverser;
- engine air bleed intake ducts;
- wheels and brakes;
- cockpit and cabin windows;
- PITOT PROBES, STATIC PORTS, TAT PROBE;
- closed doors and emergency doors.

4.7.21.2 The following must be done before starting the de-icing procedure:

- close the APU BLEED and PACK SWITCH;
- close the doors, sliding windows and hatches;
- set the stabilizer to the highest NOSE-DOWN position and the elevator with the trailing edge down (PUSH THE CONTROL STICK – NOSE-DOWN);
- set the high-lift devices in the fully retracted position. If the high-lift devices have not been retracted due to icing and snow has fallen on the wing - it is allowed to treat the wing and its high-lift devices using the one-step treatment method. Retract the high-lift devices making sure that the snow or ice is completely removed.

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4.7.21.3 When applying the fluid, follow the rule from TOP to BOTTOM, from the LEADING EDGE to the TRAILING EDGE, and SYMMETRICALLY LEFT and RIGHT HALF WING, STABILIZER, FIN. When selecting the fluid concentration, it is necessary to consider the ambient air temperature and aircraft structure temperature (the fuel tank temperature probe can be used).

4.7.21.4 After de-icing it is necessary to do the following:

- check the deflection of all control surfaces for a full stroke, using the ground personnel for observation;
- check all pitot probes and static ports (including on engines) to make sure they are not blocked by snow or ice;
- check the landing gear and wheel wells for any snow or ice that may have been deposited on/in them during the aircraft treatment;
- check the engine air intakes and IAMS for snow or ice;
- check the drain holes to make sure they are not blocked by snow or ice;
- make sure the LP compressor can rotate easily;
- make sure that all doors including the emergency doors and emergency escape slide compartment doors are clean from ice;
- switch on the air bleed from the engines and switch on the IAMS after preliminary blowdown (e.g., start of the main engines or the aircraft de-icing system).

4.7.21.5 A pre-departure check, which is the responsibility of the aircraft pilot-in-command, is carried out to ensure that the critical aircraft surfaces are free from ice, snow, slush or frost before departure. This check is made, if possible, just prior to departure and usually from the aircraft by visual inspection of the wings and other surfaces. The pre-departure check procedure is an important part of ground operations and the only means by which the aircraft pilot-in-command can make sure that the aircraft complies with the Clean Aircraft Concept before departure. If possible, at the request of the aircraft pilot-in-command, the external inspection of the critical aircraft surfaces immediately prior to departure can be conducted by the ground personnel.


4.7.21.6 The aircraft pilot-in-command must constantly monitor weather and aircraft conditions to ensure compliance with the Clean Aircraft Concept requirements. If, after the internal or external inspection of the critical aircraft surfaces, it is determined that these requirements are not met, the de-icing procedure must be repeated.

4.7.22 Special checks.

4.7.22.1 A check for clear ice often formed by the effects of cold fuel in the wing tanks may be required during rain or high humidity conditions and for certain types of aircraft. This type of ice is very difficult to detect, especially in low lighting conditions or on wet wings. To detect this type of icing, special checks can be made at the request of the aircraft pilot-in-command.

4.7.22.2 Under the conditions of precipitation or fog, or when moisture may splash, be blown by wind gusts, or sublimate on critical surfaces at sub-zero temperatures, many factors influence on whether and how much ice, frost, or snow appears, causing the surface roughness. However, even in weather conditions with temperatures above freezing, the aircraft that have just landed after descending from a high altitude or refuelled with very cold fuel may have wings with temperatures below 0°C due to the fact that the fuel in the wing tanks has a sub-zero temperature. This supercooling effect ("fuel icing") can cause ice to form on wing surfaces. Listed below are most factors that contribute to the accumulation of freezing precipitation and fuel icing:

- ambient air temperature;
- relative humidity;
- type and intensity of precipitation;

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- type and density of fog;
- wind speed and direction;
- aircraft surface temperature and temperature of fuel in the wing tanks;
- previously carried out de-icing treatment, temperature, type and concentration of the fluid applied, period of time elapsed after the treatment.

4.7.22.3 Only the personnel who have undergone theoretical and practical training and who have duly verified skills for the safe performance shall be allowed to carry out the de-icing and anti-icing operations. The personnel carrying out the de-icing operations shall be provided with the appropriate protective clothing and personal protective equipment. Responsibility for the safety of this work lies with their implementers and organizers. In case of any contact of the de-icing/anti-icing fluids with eyes, exposed skin, mucous membranes it is necessary to immediately flush them with plenty of clean water and consult a doctor. De-icing/anti-icing fluids are poisonous, their ingestion may cause damage to health up to and including death.

4.8 Aircraft salvage/recovery.

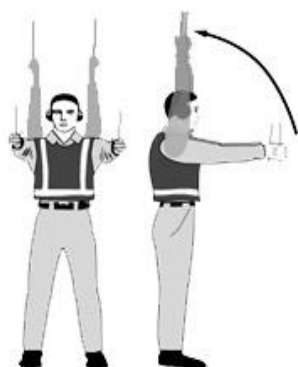
4.8.1 Aircraft salvage/recovery shall be performed by the airport on the basis of ground handling agreements entered into between the operator and the airport (handling company) at the expense of the operator (Article 89, Clause 2 of the RF Air Code).

4.9 Aircraft marshalling signals

4.9.1 Only the specially trained and authorized personnel are allowed to marshal the aircraft. The aircraft marshaller is responsible for giving standard aircraft marshalling signals during the aircraft taxiing into and out of the parking stand. All signals given must be clear and precise.

4.9.2 The aircraft marshaller must wear a special vest with fluorescent markings that allow the aircraft crew to easily identify him as the aircraft marshaller. Signal wands, signal paddles, or gloves must be used for all signals by the ground personnel involved in the process.

Обозначение стоянки



Поднимите полностью вытянутые руки с жезлами прямо над головой, показывая вверх, перемещайте руки вперед и назад, чтобы предотвратить сливание с задним планом.

Продолжение руления прямо вперед



Согните вытянутые руки в локтях и перемещайте жезлы вверх и вниз от талии к голове.

Уменьшение скорости



Опускайте руки вниз «похлопывающими» движениями, перемещая жезлы вверх и вниз от талии к коленям.

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Поворот направо (с точки зрения пилота)



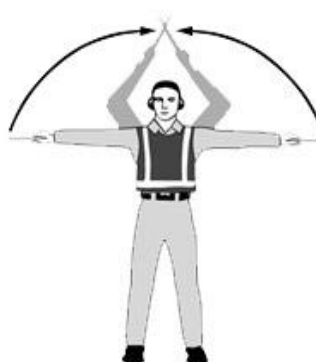
Левая рука с жезлом находится под углом 90° к туловищу, при этом правой рукой подавайте сигнал движения вперед прямо. Интенсивность передачи сигнала указывает пилоту на желаемую интенсивность осуществления маневра.

Поворот налево (с точки зрения пилота)



Правая рука с жезлом находится под углом 90° к туловищу, при этом левой рукой подавайте сигнал движения вперед прямо. Интенсивность передачи сигнала указывает пилоту на желаемую интенсивность осуществления маневра.

Обычная остановка



Полностью вытяните руки с жезлами в стороны так, чтобы между туловищем и руками был угол 90° . Медленно поднимайте руки над головой до скрещивания жезлов.

Экстренная остановка



Резко вытяните руки с жезлами над головой так, чтобы жезлы были скрещены.

Позиция выжидания



Полностью вытяните руки с жезлами вниз так, чтобы между руками и туловищем образовался угол 45° . Находитесь в таком положении до тех пор, пока самолет не будет готов к следующему маневру.

Установить тормоз



Поднимите руку чуть выше уровня плеч, рука не сжата в кулак. Убедившись в наличии визуального контакта с летным экипажем, сожмите руку в кулак. НЕ МЕНЯЙТЕ ПОЛОЖЕНИЯ до тех пор, пока не увидите подтверждения от летного экипажа в виде отогнутого вверх большого пальца.

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Снять с тормоза



Поднимите руку чуть выше уровня плеч, рука сжата в кулак. Убедившись в наличии визуального контакта с летным экипажем, разожмите кулак. НЕ МЕНЯЙТЕ ПОЛОЖЕНИЯ до тех пор, пока не увидите подтверждения от летного экипажа в виде отогнутого вверх большого пальца.

Колодки установлены



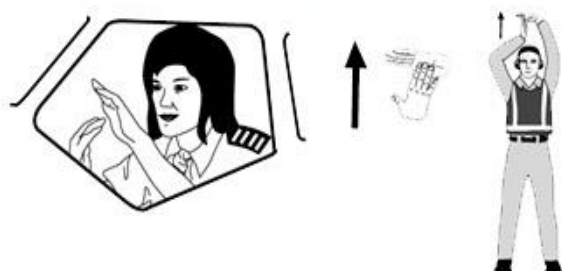
Руки с жезлами полностью вытянуты над головой. Сближайте жезлы «тыкающими» движениями до тех пор, пока жезлы не соприкоснутся.

Колодки убраны



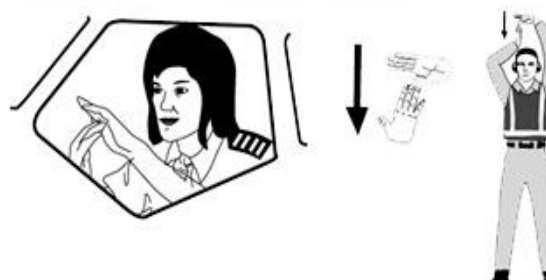
Руки с жезлами полностью вытянуты над головой. Разводите жезлы «тыкающими» движениями. НЕ убирайте колодки до тех пор, пока не получено разрешение от летного экипажа.

Наземное питание подключено



Руки подняты выше головы, левая рука поднята и ладонь разжата, кисть расположена горизонтально, кончики пальцев правой руки касаются левой ладони и движутся к центру (формируя букву "Т"). Ночью, могут использоваться освещенные жезлы, чтобы сформировать "Т" выше головы.

Наземное питание выключено



Руки подняты выше головы, левая рука поднята и ладонь разжата, кисть расположена горизонтально, кончики пальцев правой руки касаются левой ладони (формируя букву "Т"), затем правая рука отводится от левой. Ночью, могут использоваться освещенные жезлы, чтобы сформировать букву "Т" выше головы.

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Включить переговорные устройства




Разведите локти в стороны и прижмите обе ладони к обоим ушам, придав ладоням чашевидную форму.

Не касаться средств управления



Правая рука выше уровня головы и сжата в кулак или держит жезл в горизонтальном положении, левая рука остается в стороне на уровне колена.

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