HIGHLIGHTS

REVISION NO. 75 Jun 01/15

Pages which have been revised are outlined below, together with the Highlights of the Revision

CH/SE/SU C PAGES	REASON FOR CHANGE	EFFECTIVITY
CHAPTER 09		
L.E.P. 1- 1	Revised to Reflect this revision indicating new,revised, and/or deleted pages	
T. OF C. 1	Revised to reflect this revision	
09-00-00 1	Minor additions and amplification **REVISED PROCEDURE TO DELETE TAXING PROCEDURE.**	
09-11-00 56	Minor additions and amplification **REVISED PROCEDURE TO ADD STEPS REGARDING TOWING WITH TIRES DEFLATED.**	
09-21-00 1	Mod.0001X0057 removed **TECHNICAL PUBLICATION-BASIC MODIFICATION.** Mod.2968M8171 removed No definition Mod.3348M4458 removed No definition Mod.5994M6845 removed No definition Minor additions and amplification **REVISED PROCEDURE TO DELETE TAXIING PROCEDURE.**	
09-22-00 1- 2	Topic cancelled	

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CHAPTER 09

TOWING & TAXIING

LIST OF EFFECTIVE PAGES

N, R or D indicates pages which are New, Revised or Deleted respectively
Remove and insert the affected pages and complete the Record of Revisions and the Record of Temporary Revisions as necessary

CH/SE/SU	C	PAGE	DATE
RECORD			
OF TEMP.			
REVISION			
L.E.P.	R	1- 1	Jun01/15
T. of C.	R	1	Jun01/15
09-00-00	R	1	Jun01/15
09-00-00		2	Dec01/89
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CHAPTER 09

TOWING & TAXIING

TABLE OF CONTENTS

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TOWING AND TAXIING GENERAL

1. General

CAUTION : DO NOT TOW AIRCRAFT WHENEVER DIMENSION "H" EXCEEDS 300 MM (11.811 IN.) IN ORDER TO AVOID DETERIORATION OF NOSE WHELL CENTERING CAMS.

(Ref. Fig. 001)

A. Equipment and Materials

ITEM	DESIGNATION
Referenced Procedures	
- 05-57-00, P. Block 1	Aircraft Stability
- 10-21-00, P. Block 1	Mooring

B. Towing the Aircraft

The aircraft may be towed by either the nose or the main landing gear.

- By the nose gear : normal towing on flat, hard ground.
- By the main gear : on soft, muddy ground.

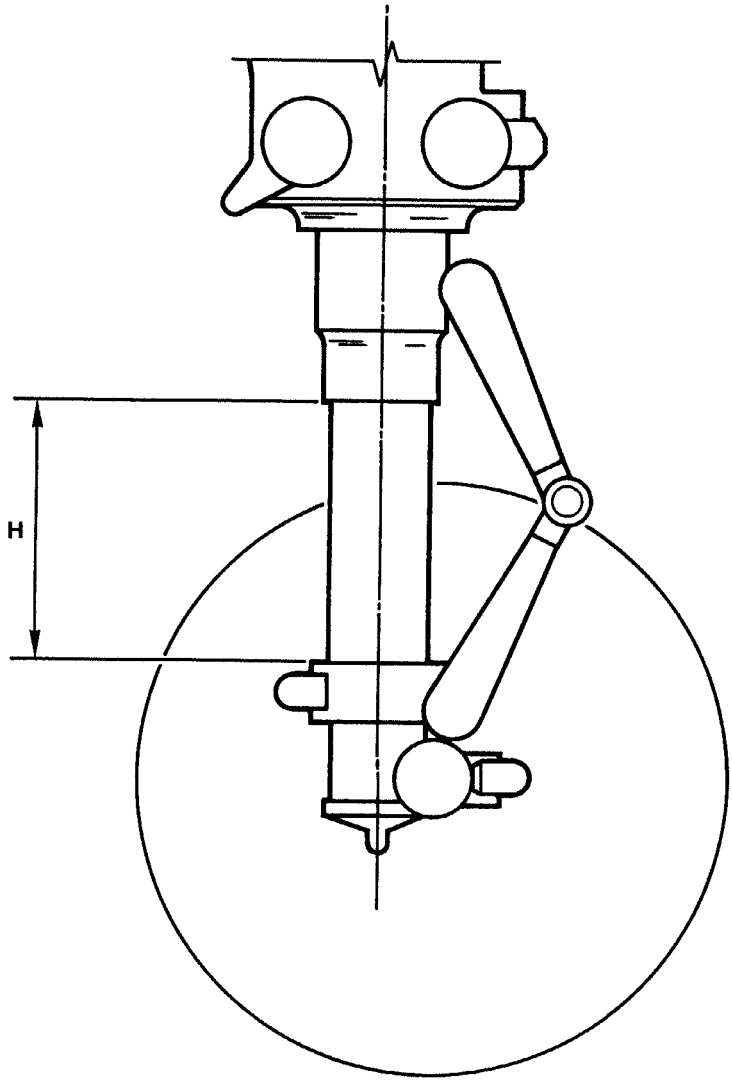
R We recommend that the operators refer to their local/airport regulations
R to write their maintenance taxiing procedure.

CAUTION : TOWING OR TAXIING THE AIRCRAFT WITH ENGINE COWLINGS OPEN IS SPECIFICALLY FORBIDDEN DUE TO POSSIBILITY OF DAMAGE TO COWLS AND NACELLE STRUCTURE.
ALL COWLS (FAN, REVERSER AND CORE) MUST BE CLOSED AND LATCHED, PRIOR TO : TOWING OR TAXIING.

C. Towing the Aircraft with one or Both Engines Removed

The Aircraft may be towed with one or both engines removed but some precautions must be taken:

- before towing the aircraft, check the aircraft stability (Ref. 05-57-00, P. Block 1)
- for external storage, it is necessary to moor by the nose landing gear (Ref. 10-21-00, P. Block 1)
- it is possible to tow the aircraft with engine cowlings on, if all of them are closed and latched.



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Maximum Extension Of Nose
Gear Shock Absorber During Towing
Figure 001

TOWING

R 1. Towing by the Nose Gear
R **WARNING : MAKE SURE THAT DURING THE TOWING OPERATION, NO PERSONS GO WHERE THE AIRCRAFT CAN CAUSE THEM INJURY.**

R This procedure is for towing of the aircraft in maintenance configuration.
R It is also permitted to use this procedure to disengage the aircraft from the gate area in these conditions:
R . A push back with one or several turns or stops and starts and
R . A forward tow without turns or multiple stops/starts.
R NOTE : Operational towing, i.e. towing an aircraft, loaded with passengers, fuel, and cargo, from the terminal gate or parking area, to a remote location is not permitted.
R NOTE : For aircraft with cabin and/or cargo compartment(s) floor panels removed, smooth and low-speed towing is recommended.

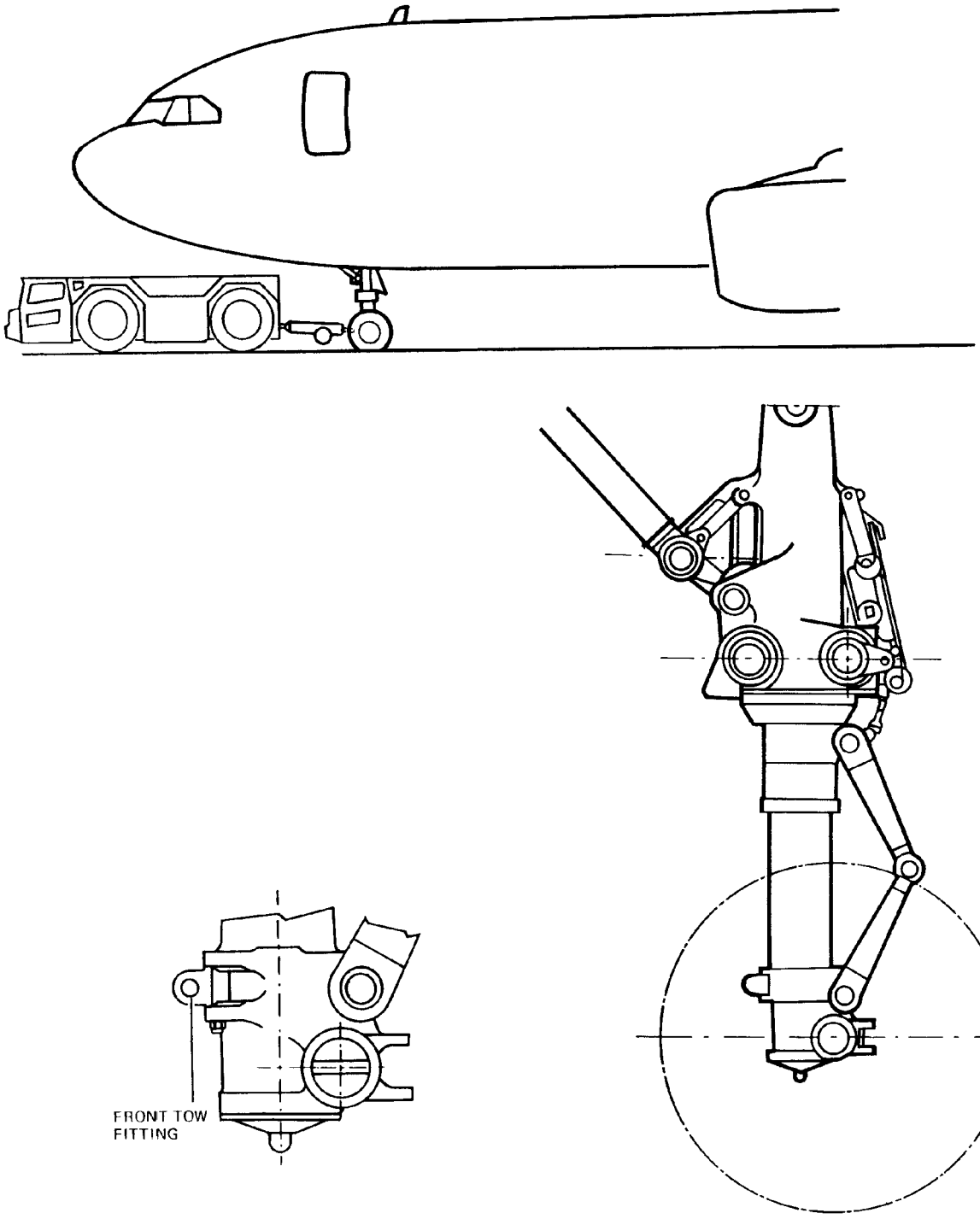
R A. General (Ref. Fig. 001)
R A towing fitting is provided on front of nose landing gear and is used for rearward pushing or forward pulling with a tractor placed forward of the nose gear.
R NOTE : Towing by the nose gear from the rear is not permitted with the engines at idle (ground idle).
(Ref. Fig. 002)

**ON A/C 226-226, 229-249,

(1)Equipment and Materials

ITEM	DESIGNATION
(1)	Wheel Chocks
(2)D22333000	Ground Safety Pin MLG
(3)C23157-0-1	Ground Safety Pin NLG
(4)	Special tractor
(5)	Bar-Towing, Nose Gear Forward Fitting
(6)C22646	Safety Pin
Referenced Procedures	
- 05-57-00, P. Block 1	Aircraft Stability
- 24-23-00, P. Block 301	Auxiliary AC Generation
- 24-41-00, P. Block 301	AC External Power Control
- 29-23-00, P. Block 301	Yellow Auxiliary Power (Power Transfer Unit)
- 32-00-00, P. Block 301	Landing Gear - General
- 80-00-00, P. Block 301	Starting - General

(2)Towing forces (Ref. Fig. 003)
To push the aircraft rearwards with the engines at idle the engine thrust must be added.



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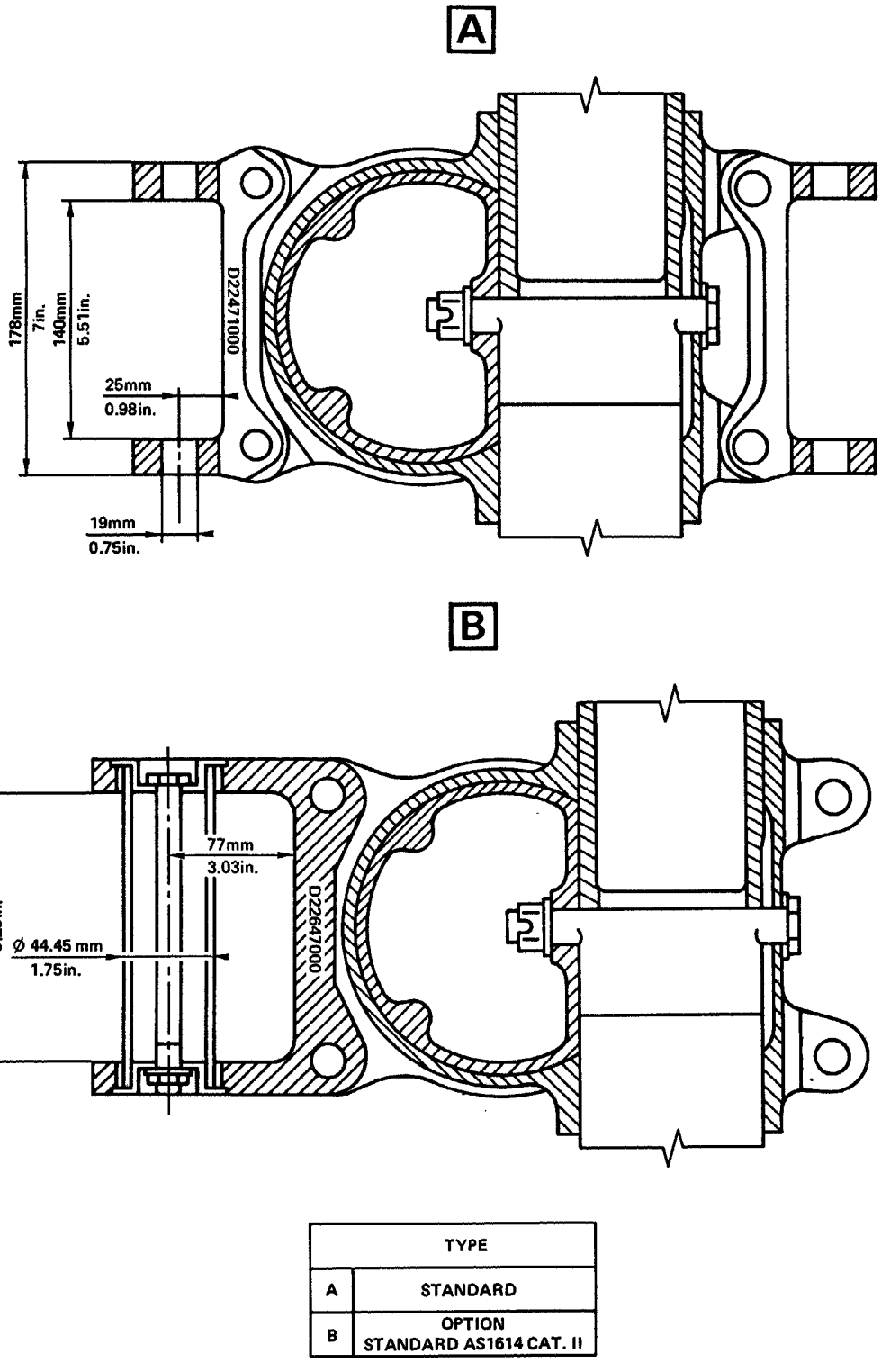
Towing by the Nose Gear
Figure 001



TYPE	
A	STANDARD
B	OPTION STANDARD AS1614 CAT. II

BM5 09 11 00 0 BAMO – 16

Nose Gear Tow Fittings
Figure 002

R **ON A/C 401-401, 404-500,

(1)Equipment and Materials

ITEM	DESIGNATION
(1)	Wheel Chocks
(2)D22333000	Ground Safety Pin MLG
(3)C23157-0-1	Ground Safety Pin NLG
(4)	Special tractor
(5)	Bar-Towing, Nose Gear Forward Fitting
(6)C22646	Safety Pin
Referenced Procedures	
- 05-57-00, P. Block 1	Aircraft Stability
- 24-23-00, P. Block 301	Auxiliary AC Generation
- 24-41-00, P. Block 301	AC External Power Control
- 29-23-00, P. Block 301	Yellow Auxiliary Power (Power Transfer Unit)
- 32-00-00, P. Block 301	Landing Gear - General
- 80-00-00, P. Block 201	Starting - General

(2)Towing forces (Ref. Fig. 003)
To push the aircraft rearwards with the engines at idle the engine thrust must be added.

**ON A/C 401-401, 404-500,

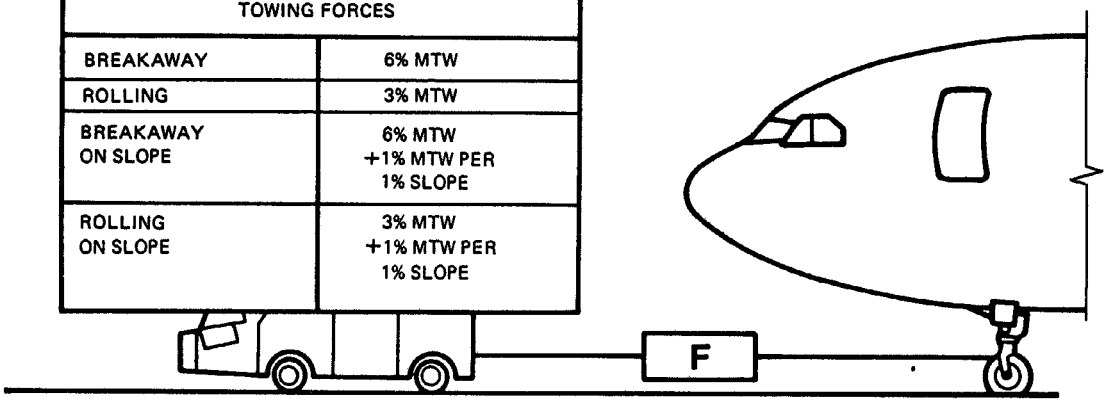
R Post SB 32-2068 For A/C 401-401,404-500,

(1)Equipment and Materials

ITEM	DESIGNATION
(1)	Wheel Chocks
(2)D22333000	Ground Safety Pin MLG
(3)C23157 100-1	Ground Safety Pin NLG
(4)	Special tractor
(5)	Bar-Towing, Nose Gear Forward Fitting
(6)C22646	Safety Pin
Referenced Procedures	
- 05-57-00, P. Block 1	Aircraft Stability
- 24-23-00, P. Block 301	Auxiliary AC Generation
- 24-41-00, P. Block 301	AC External Power Control
- 29-23-00, P. Block 301	Yellow Auxiliary Power (Power Transfer Unit)
- 32-00-00, P. Block 301	Landing Gear - General
- 80-00-00, P. Block 201	Starting - General

(2)Towing forces (Ref. Fig. 003)
To push the aircraft rearwards with the engines at idle the engine thrust must be added.

TOWING FORCES	
BREAKAWAY	6% MTW
ROLLING	3% MTW
BREAKAWAY ON SLOPE	6% MTW +1% MTW PER 1% SLOPE
ROLLING ON SLOPE	3% MTW +1% MTW PER 1% SLOPE



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DM5

Towing Forces
Figure 003

**ON A/C ALL

B. Precautions

WARNING : OBEY THESE SAFETY PRECAUTIONS DURING MOVEMENT OF THE AIRCRAFT (TOWING, PUSHBACK OR TAXIING).
MAKE SURE THAT:
- THE PATH OF THE AIRCRAFT IS CLEAR OF PERSONS, EQUIPMENT OR OTHER OBSTACLES,
- NO PERSONS GO NEAR THE TOW TRACTOR, TOWBAR, LANDING GEARS, ENGINE NACELLES OR BELOW THE AIRCRAFT FUSELAGE,
- ONLY QUALIFIED PERSONS ARE ON THE TRACTOR AND NO PERSONS SIT OR STAND ON THE TOWBAR,
- NO PERSONS GO NEAR THE AIRCRAFT BEFORE IT IS FULLY STOPPED.

THERE IS A RISK OF INJURY OR DEATH IF YOU DO NOT OBEY THESE INSTRUCTIONS.

WARNING : BEFORE POSITIONING THE NOSE GEAR ON THE TRACTOR, THE NOSE WHEEL STEERING SYSTEM MUST BE DEACTIVATED BY USING SAFETY PIN C22646.

WARNING : BEFORE POSITIONING THE LOCKING DEVICES, MAKE CERTAIN THAT THE LANDING GEAR IS DOWNLOCKED (Ref. 32-00-00, P. BLOCK 301).

WARNING : DURING TOWING/TAXIING OPERATIONS (LOW-SPEED OPERATIONS INCLUDED), EACH PERSON IN THE AIRCRAFT MUST BE IN A SEAT AND THE SEAT BELT MUST BE FASTENED.
IF THE SEAT BELT IS NOT FASTENED, THERE IS A RISK OF INJURY IF THE AIRCRAFT STOPS SUDDENLY.

CAUTION : THE LANDING GEAR BRACE STRUT LOCKING DEVICES MUST ALWAYS BE FITTED WHEN THE AIRCRAFT IS ON THE GROUND OR BEING TOWED.
USE ONLY TOWING EQUIPMENT DESIGNED OR APPROVED BY THE AIRCRAFT MANUFACTURER.

CAUTION : TOWING THE AIRCRAFT WITH ENGINE COWLINGS OPEN IS SPECIFICALLY FORBIDDEN DUE TO POSSIBILITY OF DAMAGE TO COWLS AND NACELLE STRUCTURE. ALL COWLS (FAN, REVERSER AND CORE) MUST BE CLOSED AND LATCHED, PRIOR TO TOWING.

C. Towing Preparation

(1)Landing gear safety pins.

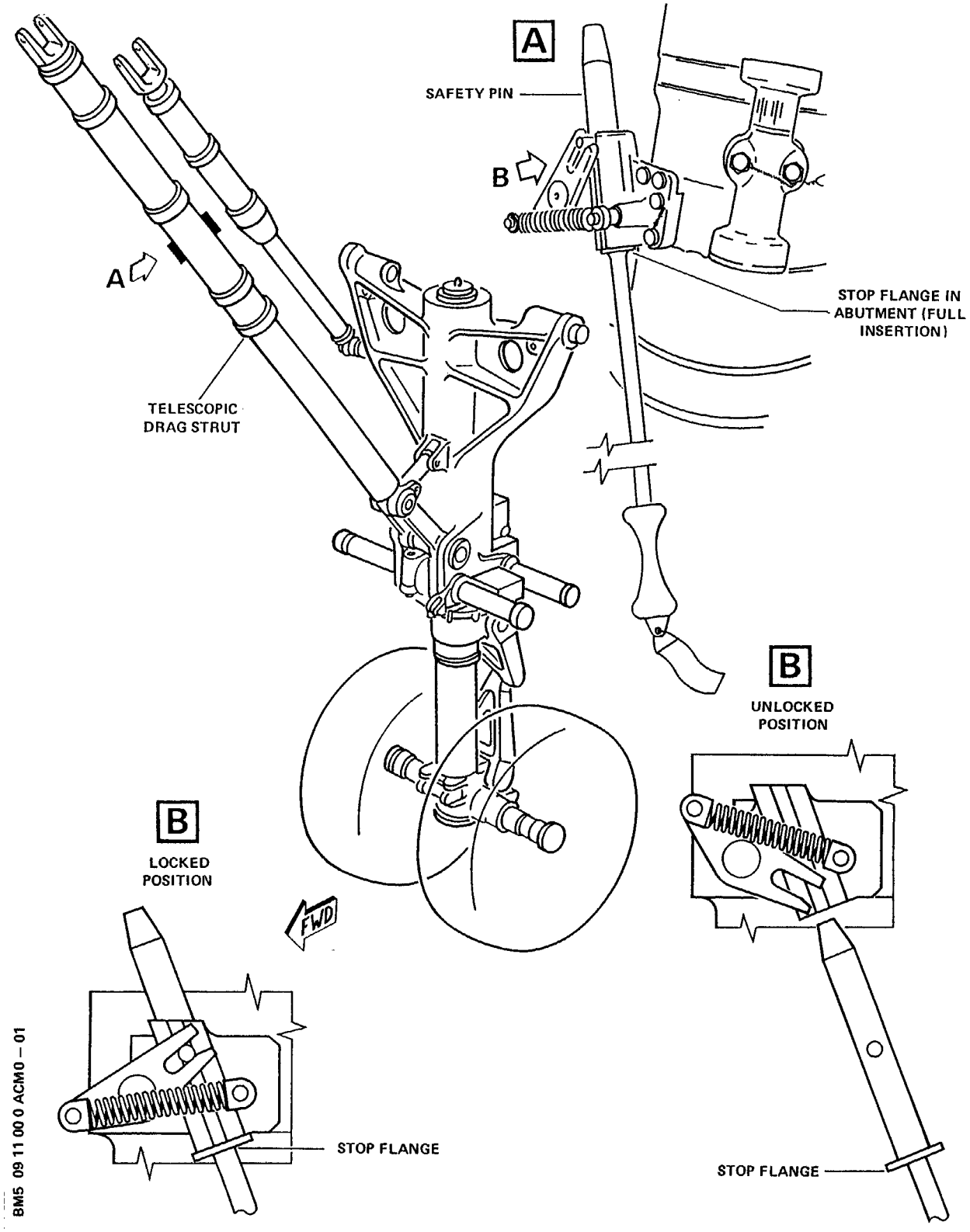
R

(Ref. Fig. 004)

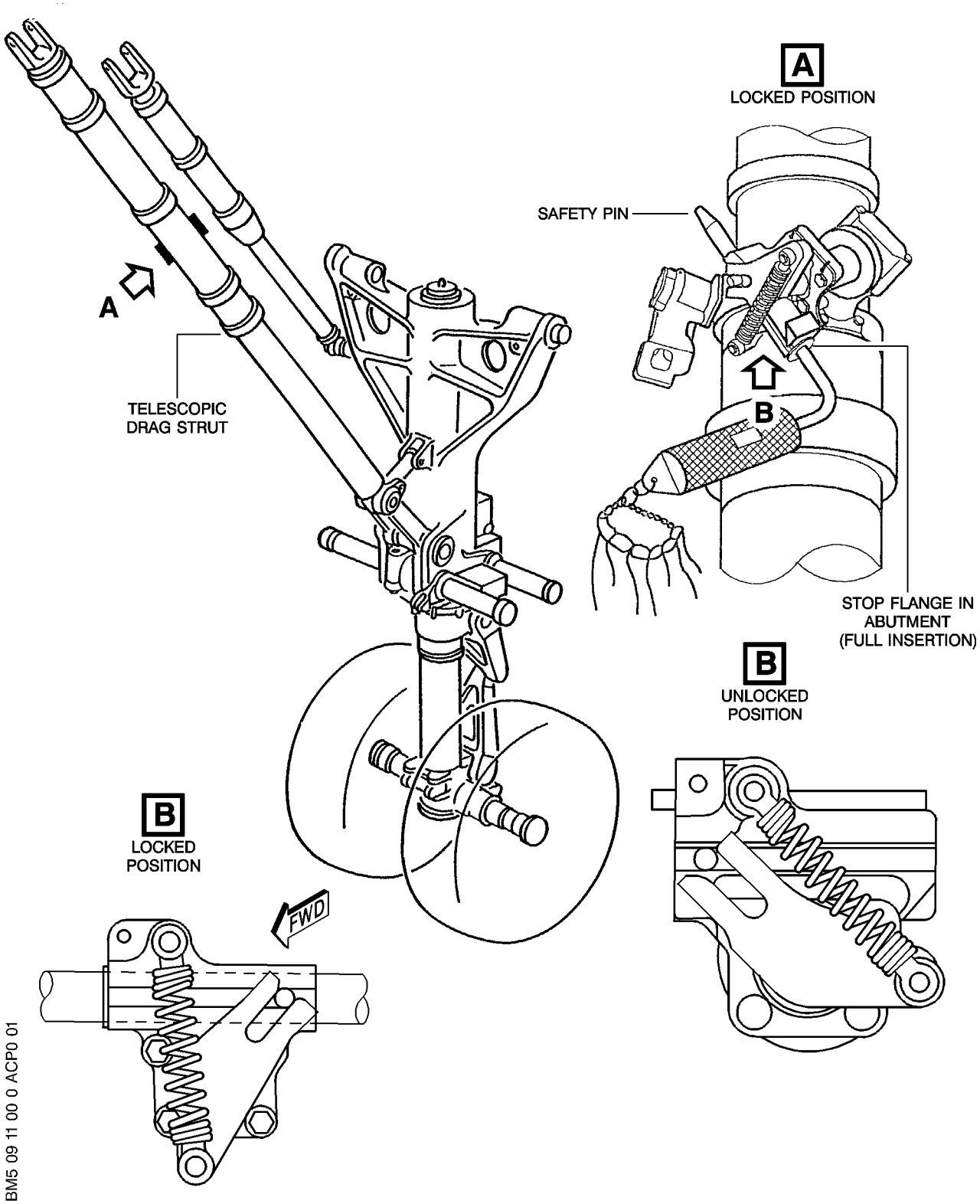
**ON A/C 401-401, 404-500,

R Post SB 32-2068 For A/C 401-401,404-500,

(Ref. Fig. 005)



Nose Landing Gear Safety Pins
Figure 004



Nose Landing Gear Safety Pins
Figure 005

**ON A/C ALL

(Ref. Fig. 006)
(Ref. Fig. 007)
The landing gear must be mechanically secured in downlocked position during towing operation by inserting ground safety pins.
WARNING : WHENEVER THE GROUND SAFETY PIN IS INSTALLED ON THE NOSE GEAR TELESCOPIC STRUT ALWAYS VISUALLY CHECK THAT :
- IT HAS COMPLETELY AND EASILY ROTATED THE FORK-TYPE LEVER OF THE GROUND LOCKING SYSTEM.
- ITS STOP FLANGE ABUTS AGAINST THE HOUSING OF THE TELESCOPIC STRUT LOCKING SYSTEM (FULL INSERTION).

WARNING : WHEN THE GROUND SAFETY PIN IS REMOVED, VISUALLY CHECK THE DOWN POSITION OF THE FORK-TYPE LEVER ON THE TELESCOPIC STRUT GROUND LOCKING SYSTEM.

NOTE : It is optional to install the landing gear safety devices when you tow or push the aircraft during flight operations. (To put the aircraft in position for the flight crew at arrival or departure).

(2)Make sure that the aircraft is stable (Ref. 05-57-00, P. Block 1).

(3)Ground crew interphone box (Ref. Fig. 008)
For towing purposes the nose wheel steering system must be deactivated. This is carried out by a two position towing lever which must be set in the towing position and locked by a safety pin.

(4)Towing angles
- The maximum angle allowed on each side of the aircraft center line is 95° whatever towing arrangement is used (Ref. Fig. 009).

R **ON A/C 401-401, 404-500,

- During towing, the towing angle must not be more than the angle shown on the nose gear secondary doors.

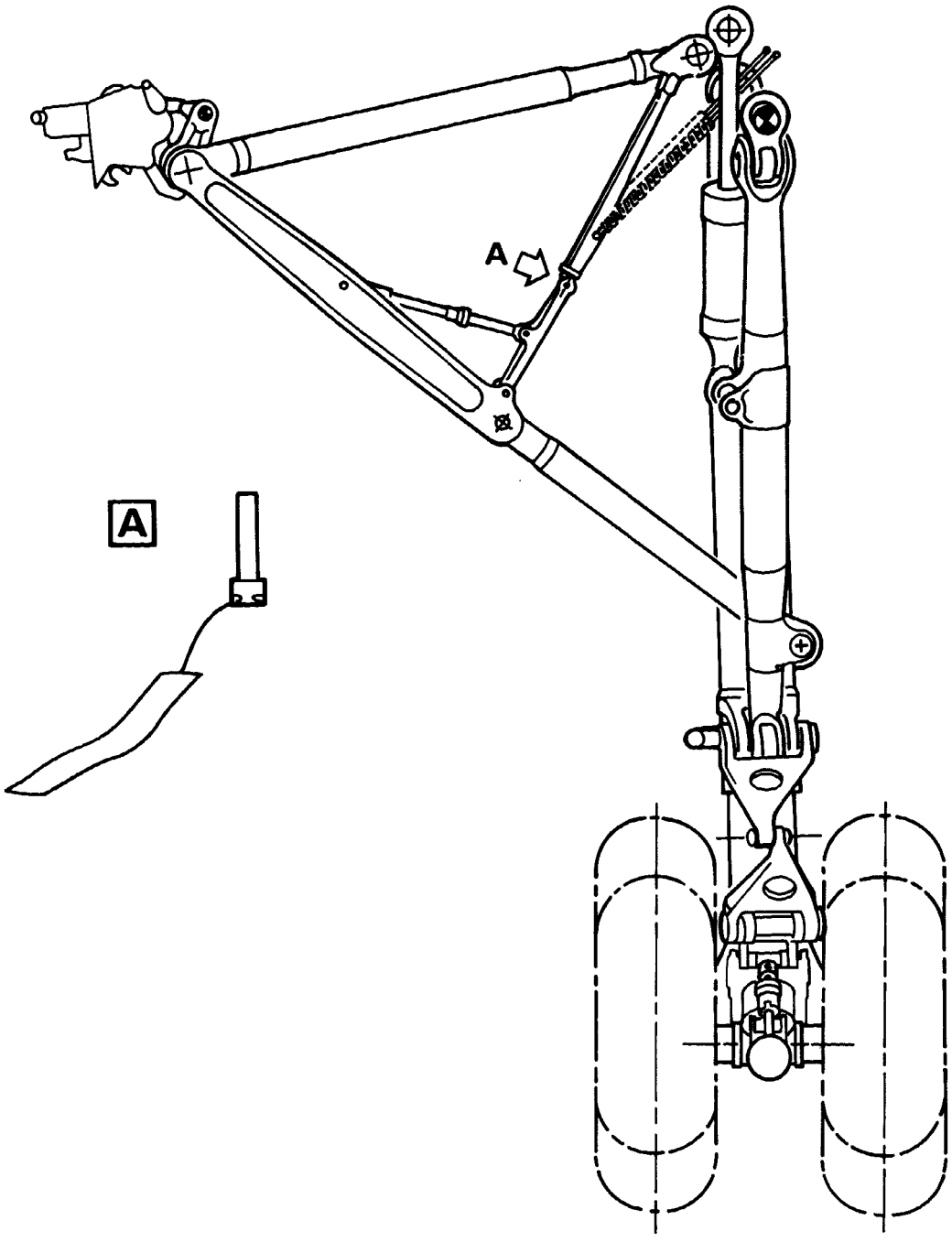
R **ON A/C 404-500,

WARNING : IF AIRCRAFT WEIGHT EXCEEDS 158T, STEERING ANGLE IS LIMITED TO 65°.

**ON A/C ALL

- Four fixed indicators are located on the nose landing gear. The center position is indicated by a forward and a rear slot.
Red marks indicate the 95° maximum steering angle (Ref. Fig. 009).
- The steering angle is limited to 65° during rearward pushing using front fitting and engines at idle to avoid the tractor entering the engine suction area.

(Ref. Fig. 010)



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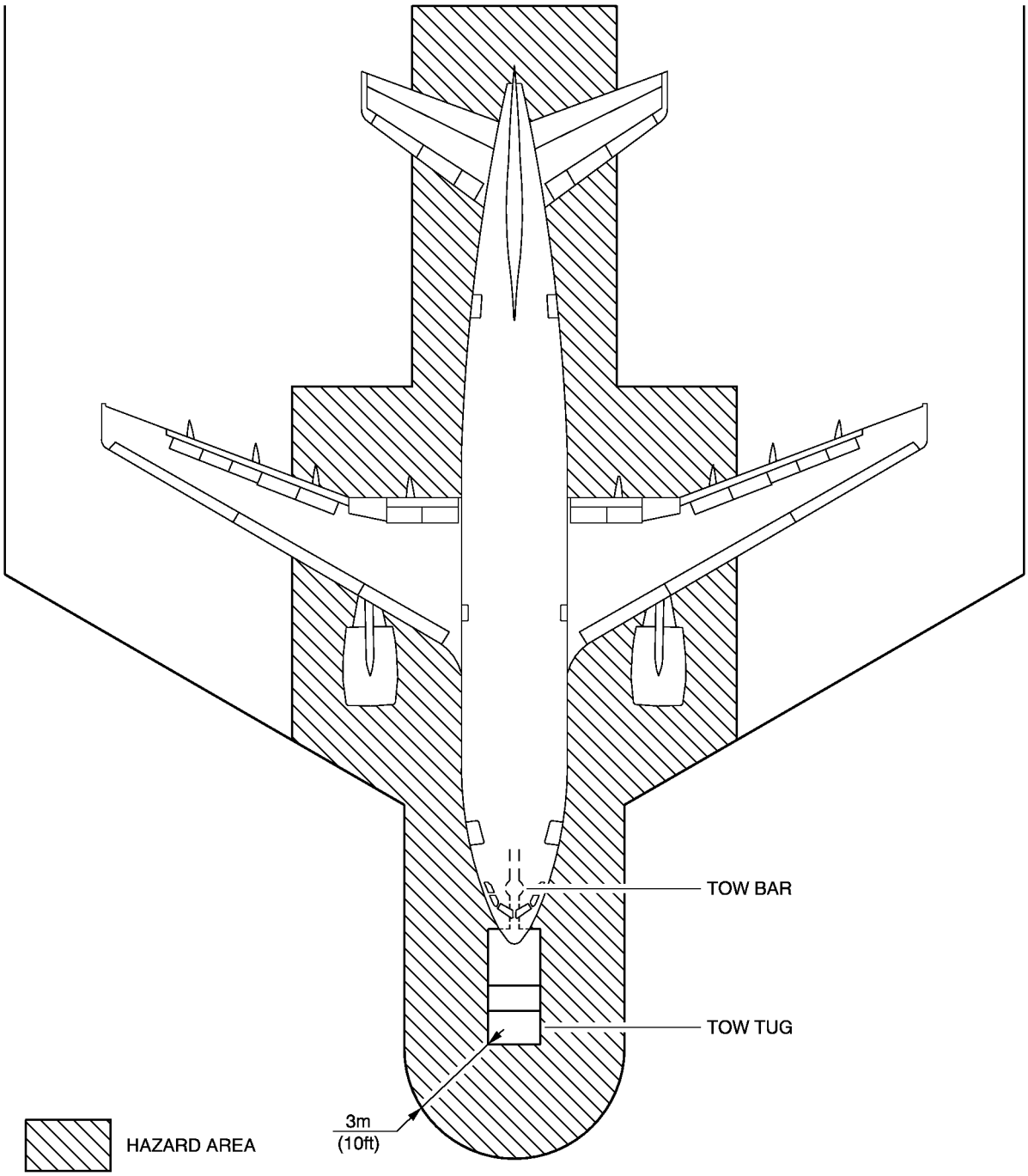
Main Landing Gear Safety Pins
Figure 006



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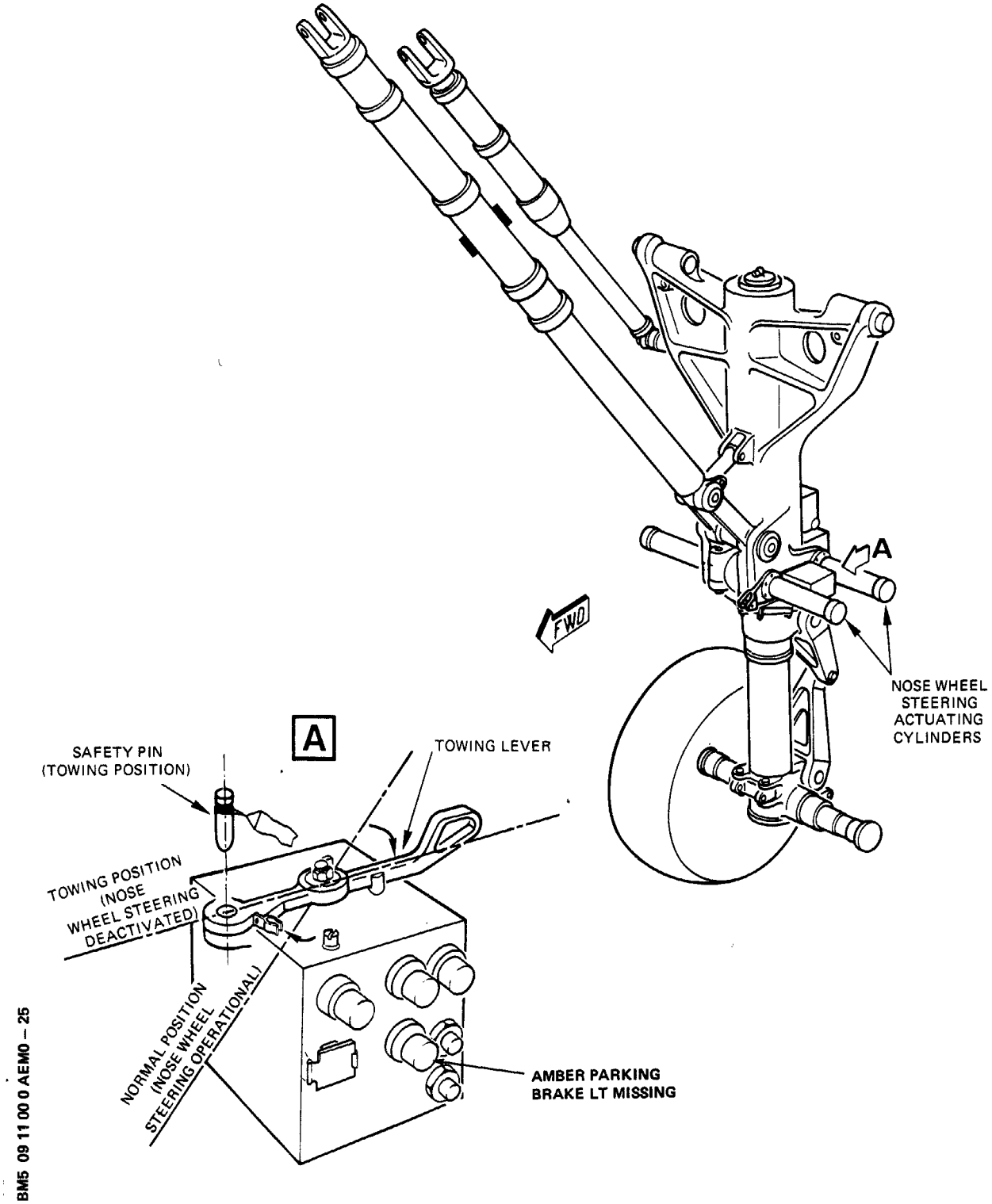
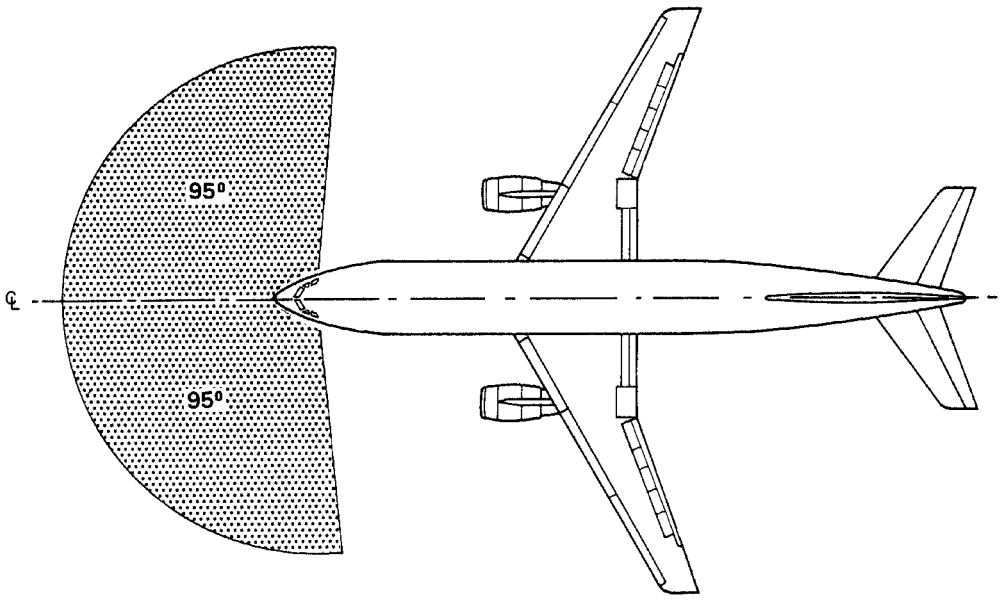
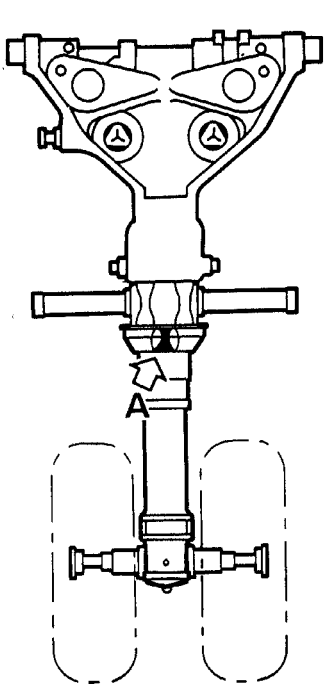
WARNING: MAINTAIN A MINIMUM OF 3 METERS (10 FEET) SEPARATION FROM THE TOWING EQUIPMENT AND ANY PART OF THE AIRCRAFT DURING MOVEMENT OF THE AIRCRAFT.

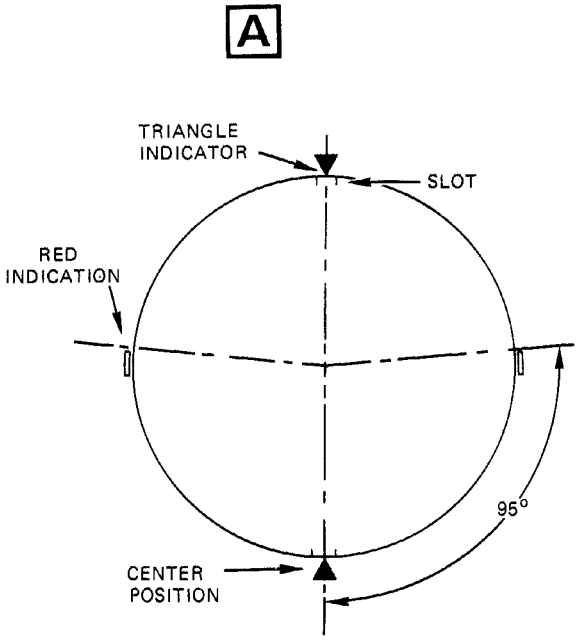
Towing - Hazard Areas
Figure 007



Interphone Box
Figure 008







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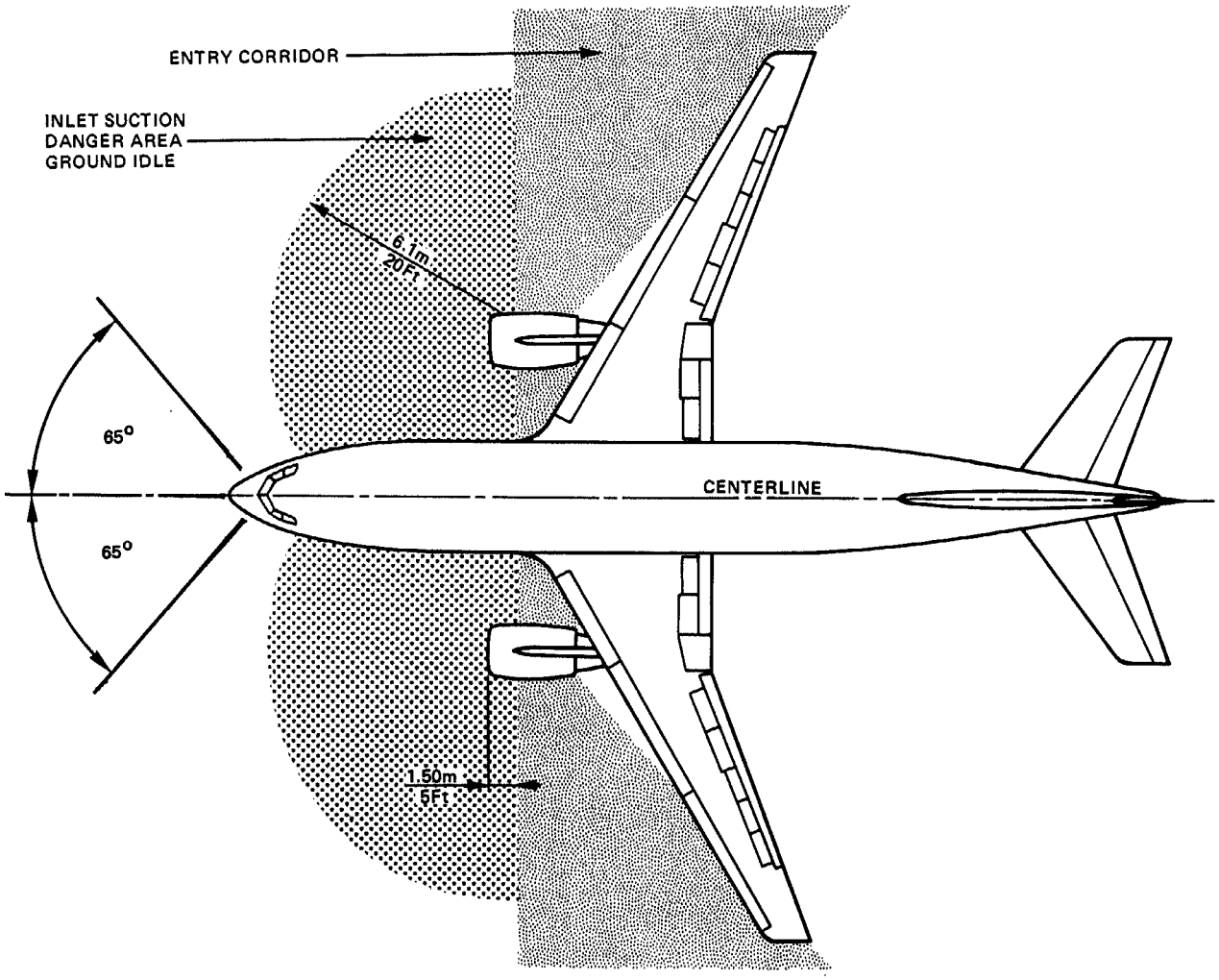
Towing Angles
Figure 009



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Towing Angles
Figure 010

(5)Towing loads.

(a)Towing load applied to nose gear must not exceed 16,555 daN.
(37217.11 lb.ft).

**ON A/C 226-226, 229-249,

(b)Ultimate shear strength of safety pins on towing bar is : 1750 m.daN.
(12907.33 lbf.ft.).

(6)Energize the aircraft electrical network
During towing operations several aircraft systems have to be electrically supplied.
Before supplying the aircraft electrical network, the Cockpit Safety Check must be performed.

(a)With the tractor (if the tractor is equipped with a GPU)
(Ref. Fig. 011)
- open access door 121EL
- connect a ground power unit provided on the tractor to a ground power receptacle located underneath the fuselage aft of the nose gear well
- energize the aircraft electrical network (Ref. 24-41-00, P. Block 301).

(b)Or with the APU
- energize the aircraft electrical network (Ref. 24-23-00, P. Block 301).

(c)Or with the engine
- start engine 2 (Ref. 80-00-00, P. Block 301).

R **ON A/C 401-401, 404-500,

(b)Ultimate shear strength of safety pins on towing bar is : 1750 m.daN.
(12907.33 lbf.ft.).

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- connect a ground power unit provided on the tractor to a ground power receptacle located underneath the fuselage aft of the nose gear well
- energize the aircraft electrical network (Ref. 24-41-00, P. Block 301).

(b)Or with the APU
- energize the aircraft electrical network (Ref. 24-23-00, P. Block 301).

(c)Or with the engine
- start engine 2 (Ref. 80-00-00, P. Block 201).

**ON A/C ALL

(7)Lighting System (Ref. Fig. 012)
If necessary, the cockpit **DOME** lights must be switched **ON**.
At night, if the anti-collision lighting is required by local airport regulations or by airline procedures the **BEACON/STROBE** lighting must be turned **ON**.

(8)Landing gear and brake system
- During towing maneuvers, one person shall be in the flight compartment in order to operate the brakes, if required.
- Before the breakaway, release the brakes and make sure that on the panel 4VU, the pressure indication on the yellow brake pressure triple indicator is correct (3000 psi (206 bars)). The pointer must be in the green zone.
  The 3000 psi (206 bars) pressure permits seven brake applications.
- If necessary, pressurize the yellow hydraulic system (Ref. 29-23-00, P. Block 301).
- Pressurize yellow hydraulic system during towing operations (Ref. 29-23-00, P. Block 301).

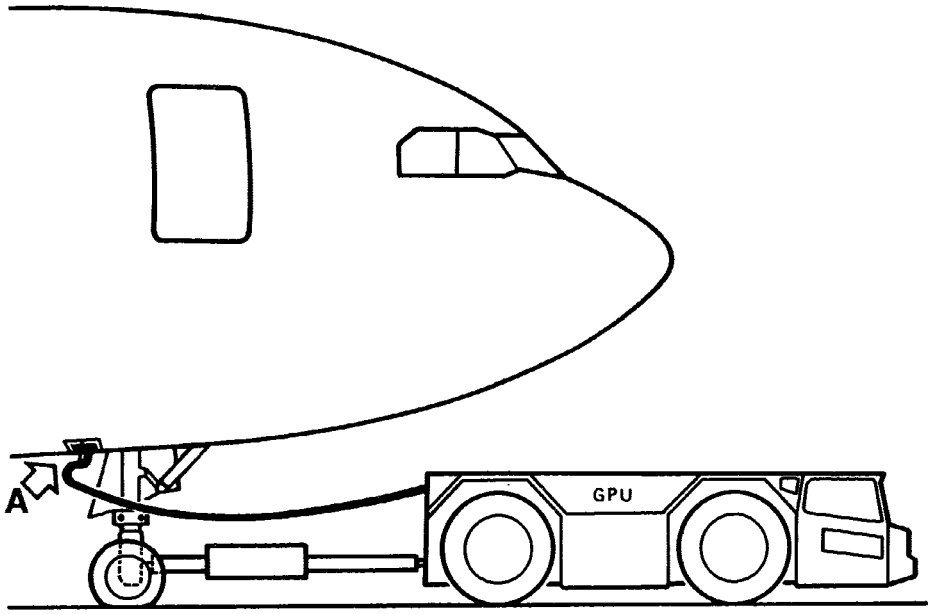
NOTE : If you energized the aircraft electrical network with the engine, do not pressurize the yellow hydraulic system.

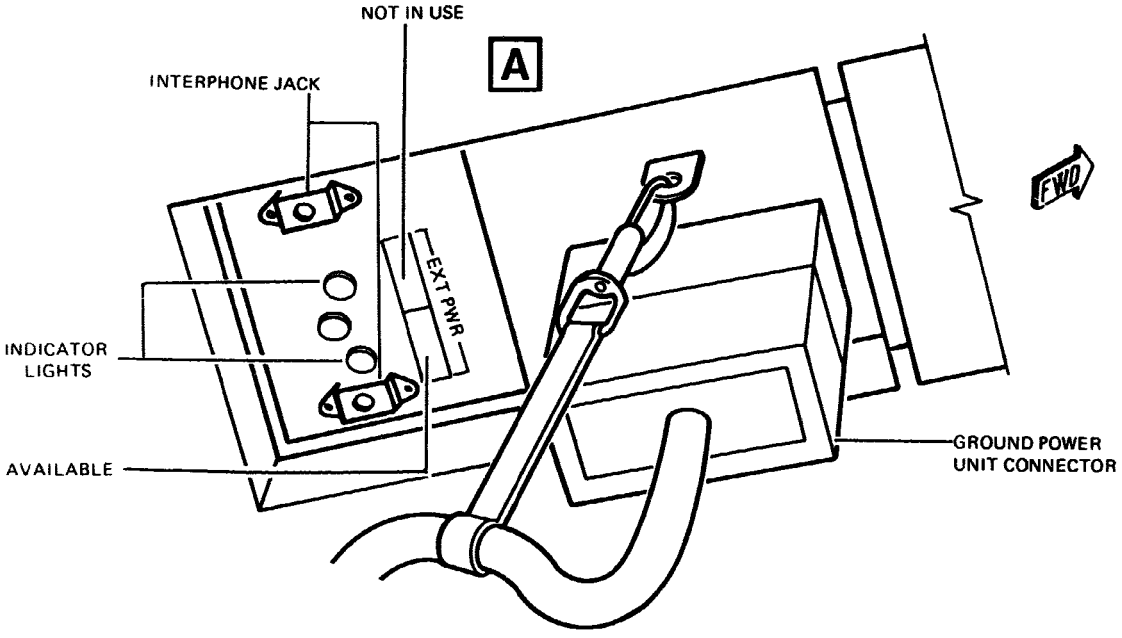
(Ref. Fig. 013)

(9)Communication systems
(a)VHF system (Ref. Fig. 014)
If communication between the aircraft and the control tower is necessary, the VHF communication system No.1 must be activated.

(Ref. Fig. 015)

(b)Flight interphone system (Ref. Fig. 016)
During the towing operation, the flight interphone system must be used providing communication between the flight compartment and the ground crew.
The ground crew boomset connection is located in the electric ground power receptacle aft of the nose landing gear well.





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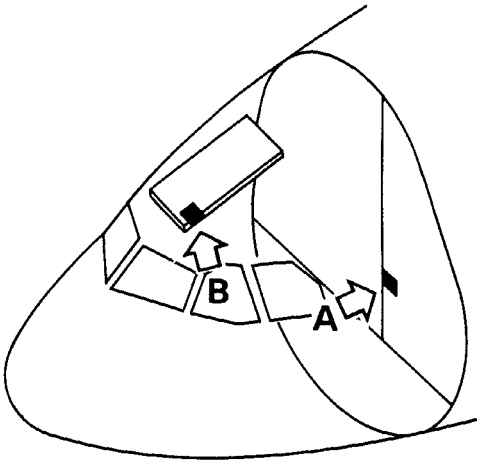
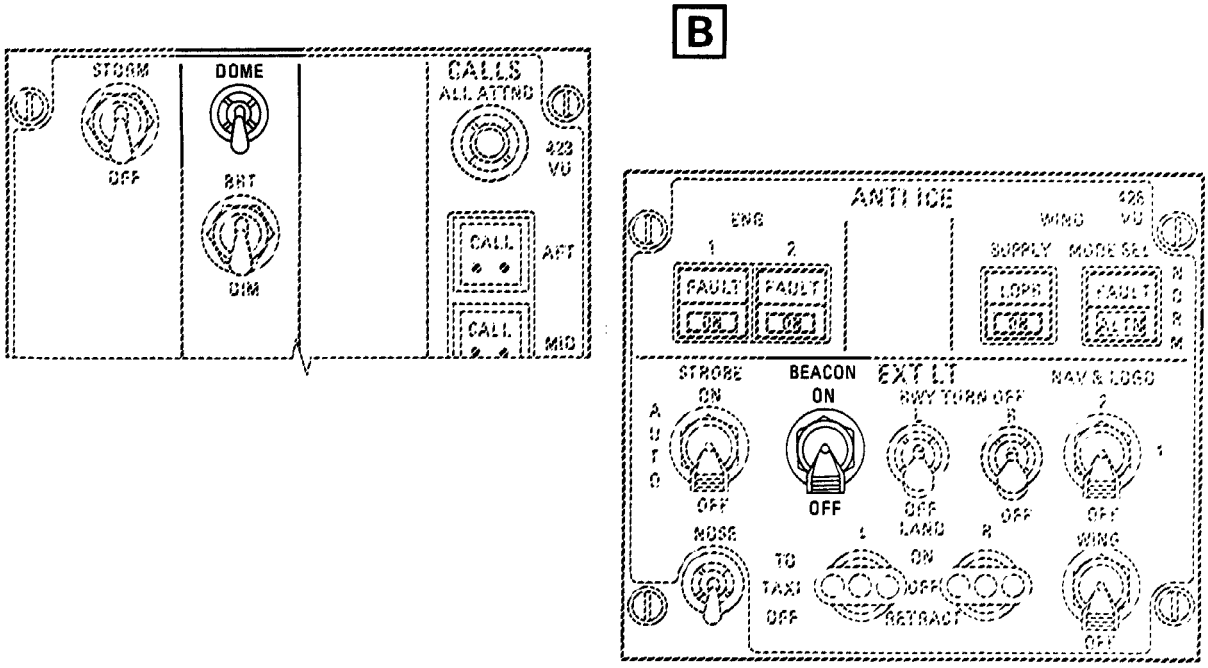
Electrical Supply
Figure 011





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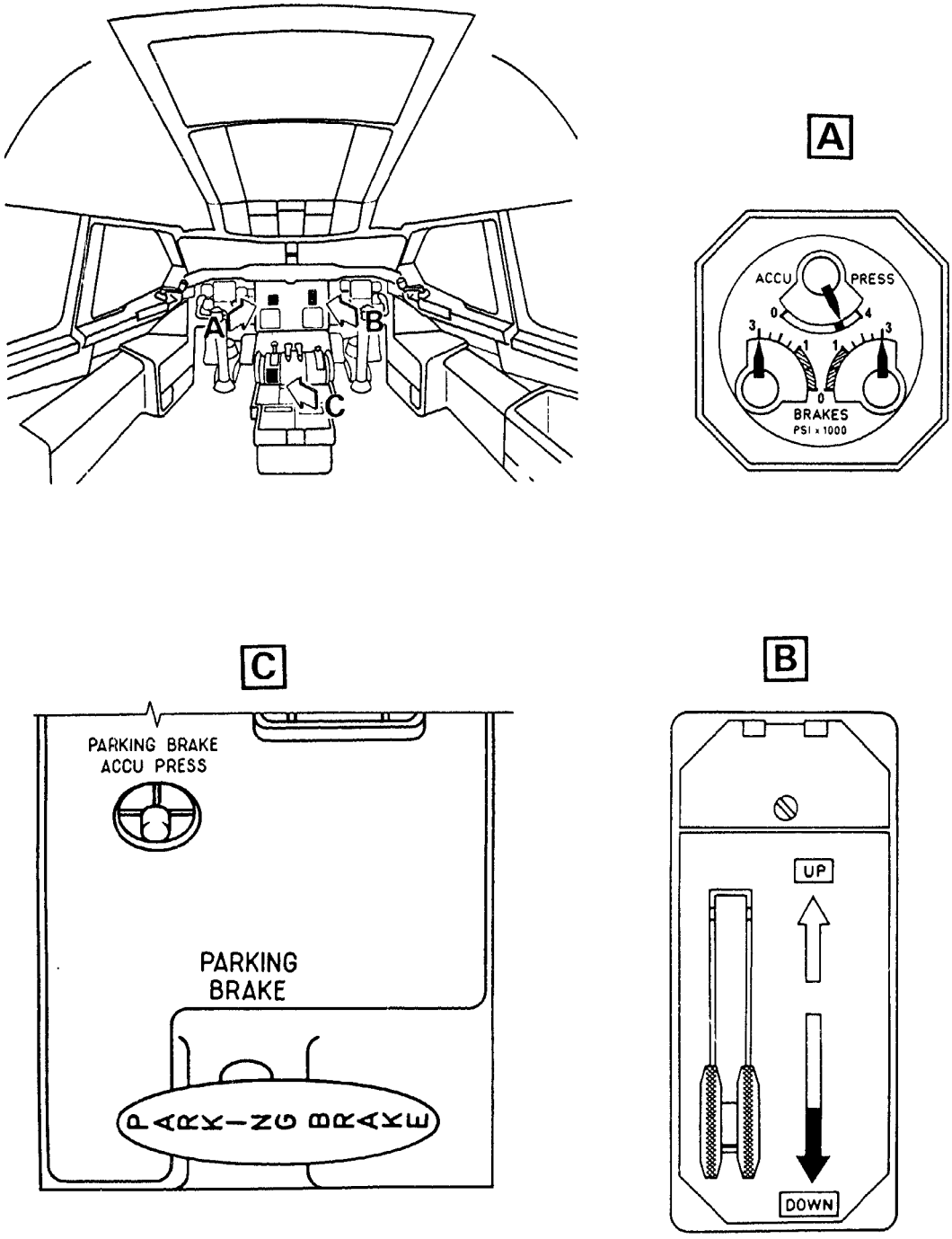
Lighting Control Panel
Figure 012



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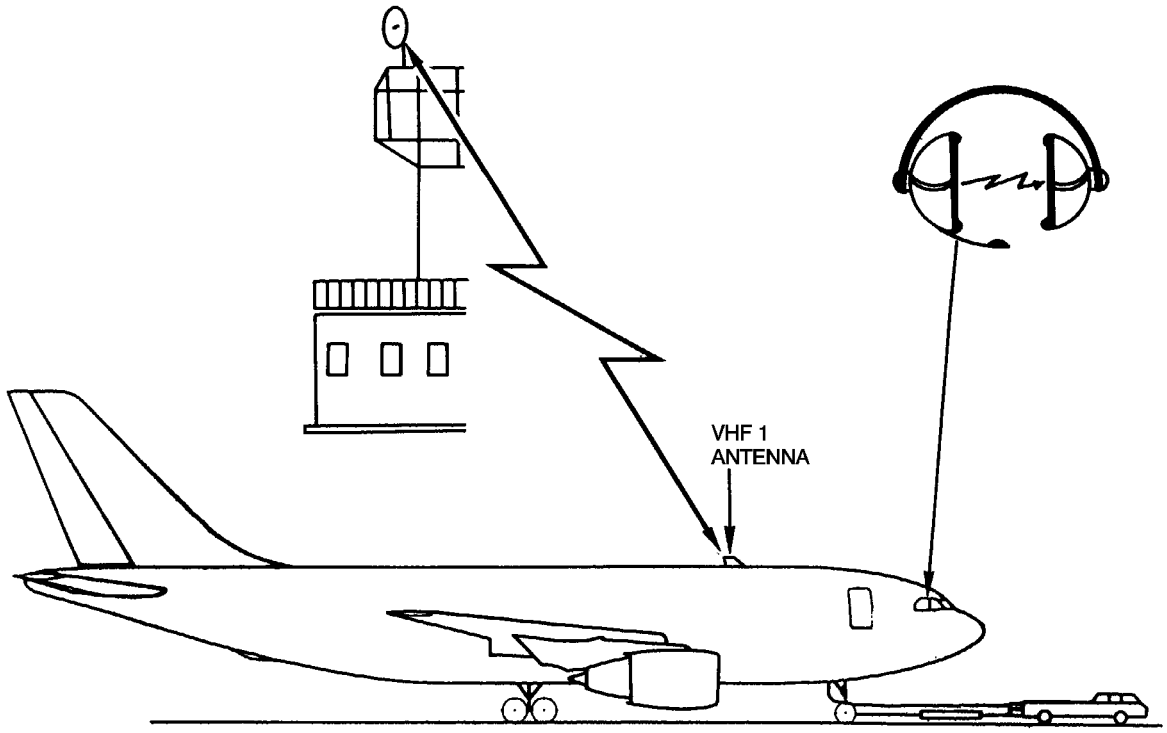
Landing Gear and Brake System
Figure 013



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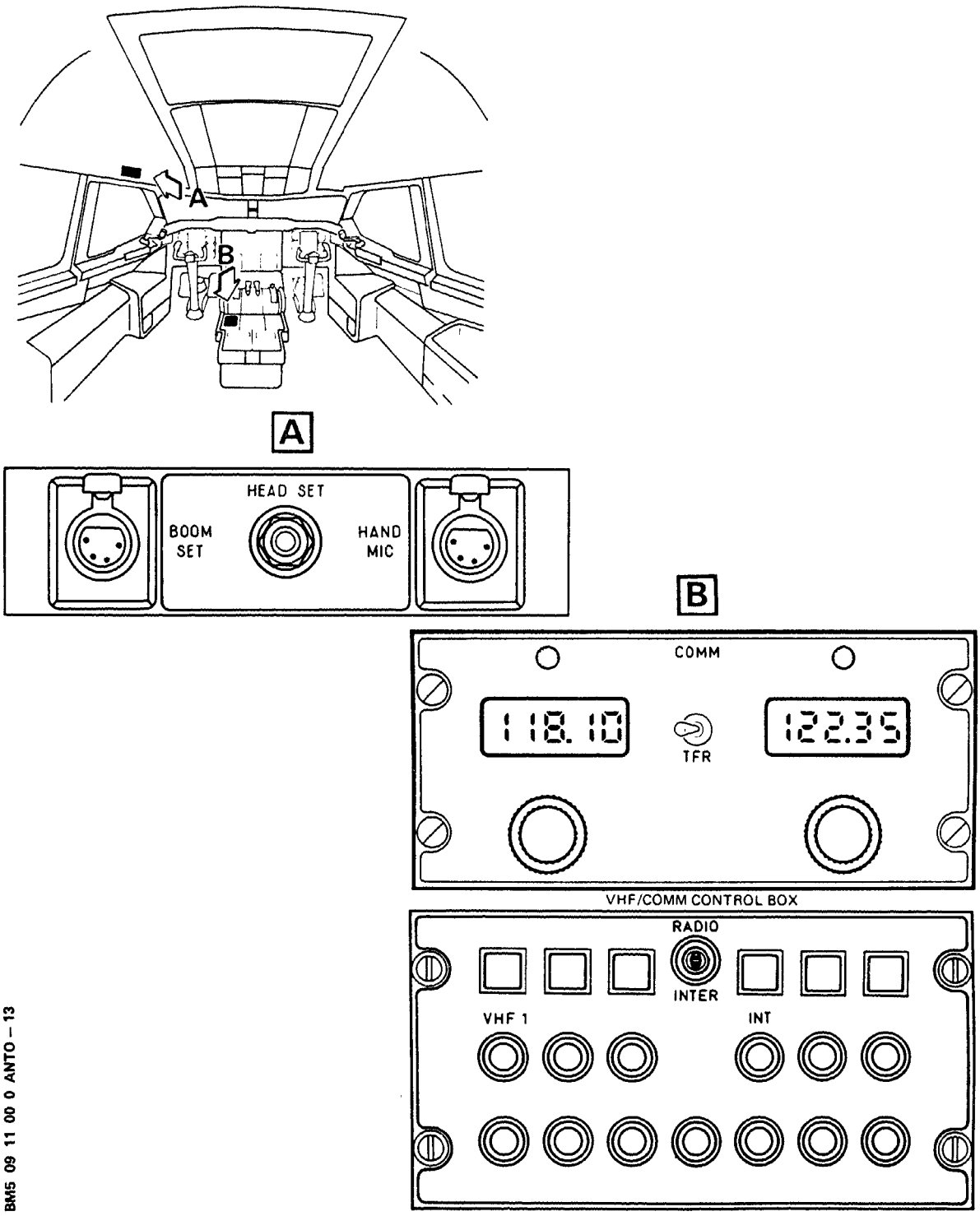
VHF System
Figure 014



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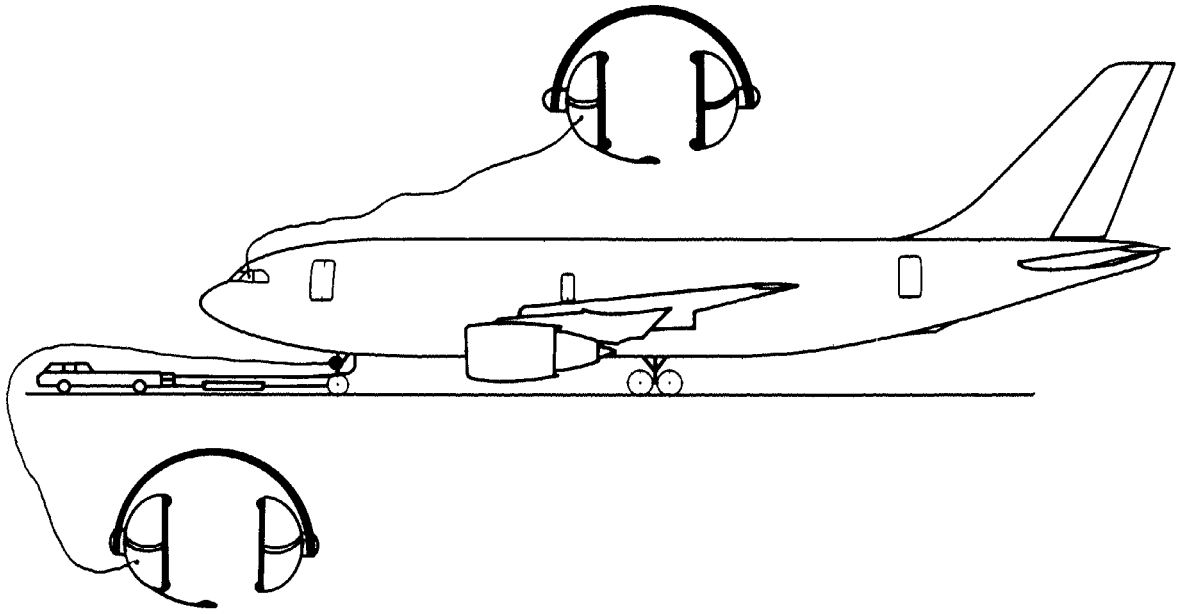
VHF System Controls
Figure 015



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Flight Interphone System
Figure 016

**ON A/C 226-226, 229-249,

D. Towing Operation
Normal towing operation should only be carried out on suitable ground surfaces.
The conventional towbar is equipped with one calibrated shear pin and two calibrated turn shear pins for gear protection against excessive loads.
NOTE : We recommend that you use a towbar that has a damping system.
NOTE : For the requirements related to towbars and towbar tractors, refer to AC 5-8.
Shock absorber reaction tends to induce a rocking movement after the aircraft is stopped. Consequently, sufficient spare must be left around the aircraft for all nose gear towing maneuvers. Towing should be carried out slowly and smoothly.
Speed limits:
- Doors closed and locked or removed, for a tractor with a towbar, a maximum speed of 25 km/h (15.5 mph) is permitted.
- Passenger/crew doors fully open and locked and/or cargo doors open in vertical position, a maximum speed of 10 km/h (6.21 mph) is permitted.

E. Towbar Disconnection (Ref. Fig. 017)
After "Pushback" (hydraulic pressure available), the towbar must be disconnected from the nose gear fittings before removing the tow lever safety pin.
In the case of nose wheel deflection, this is to avoid pressurization of the steering actuators so that the wheels align before the disconnection of the towbar.

F. Close-up
(1)De-energize the aircraft electrical network.
(a)If you energized with the tractor: (Ref. Fig. 011)
- de-energize the aircraft electrical network (Ref. 24-41-00, P. Block 301)
- disconnect ground power unit provided on the tractor from ground power receptacle located underneath the fuselage aft of the nose gear well
- close access door 121EL.

(b)If you energized with the APU:
- de-energize the aircraft electrical network (Ref. 24-23-00, P. Block 301).

(c)If you energized with the engine:
- stop engine 2 (Ref. 80-00-00, P. Block 301).

(2)Position wheel chocks (Ref. Fig. 018).
(3)Apply parking brake.

R **ON A/C 401-401, 404-500,

D. Towing Operation

Normal towing operation should only be carried out on suitable ground surfaces.
The conventional towbar is equipped with one calibrated shear pin and two calibrated turn shear pins for gear protection against excessive loads.
NOTE : We recommend that you use a towbar that has a damping system.
NOTE : For the requirements related to towbars and towbar tractors, refer to AC 5-8.
Shock absorber reaction tends to induce a rocking movement after the aircraft is stopped. Consequently, sufficient spare must be left around the aircraft for all nose gear towing maneuvers. Towing should be carried out slowly and smoothly.
Speed limits:
- Doors closed and locked or removed, for a tractor with a towbar, a maximum speed of 25 km/h (15.5 mph) is permitted.
- Passenger/crew doors fully open and locked and/or cargo doors open in vertical position, a maximum speed of 10 km/h (6.21 mph) is permitted.

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In the case of nose wheel deflection, this is to avoid pressurization of the steering actuators so that the wheels align before the disconnection of the towbar.

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(1)De-energize the aircraft electrical network.
(a)If you energized with the tractor: (Ref. Fig. 011)
- de-energize the aircraft electrical network (Ref. 24-41-00, P. Block 301)
- disconnect ground power unit provided on the tractor from ground power receptacle located underneath the fuselage aft of the nose gear well
- close access door 121EL.

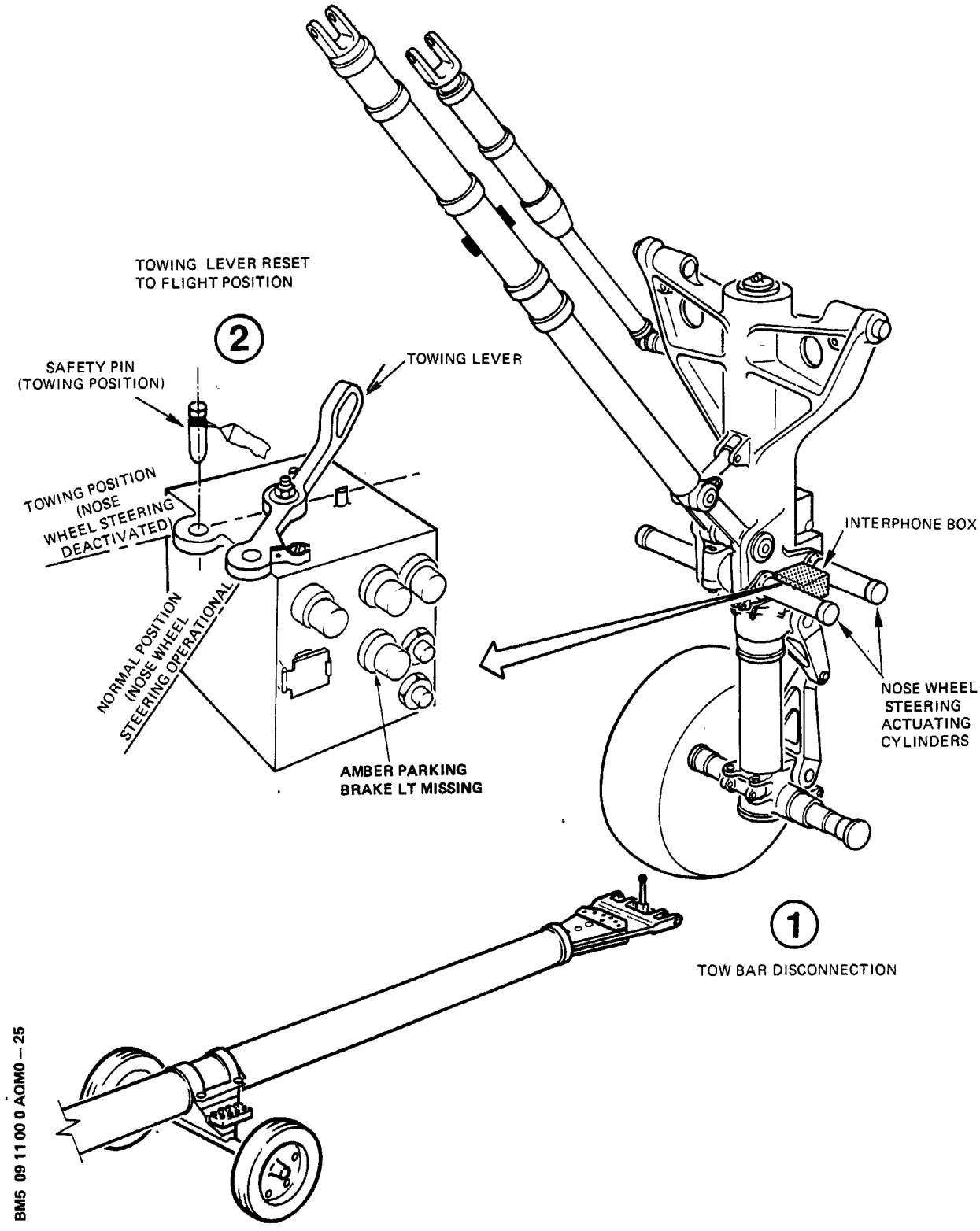
(b)If you energized with the APU:
- de-energize the aircraft electrical network (Ref. 24-23-00, P. Block 301).

(c)If you energized with the engine:
- stop engine 2 (Ref. 80-00-00, P. Block 201).

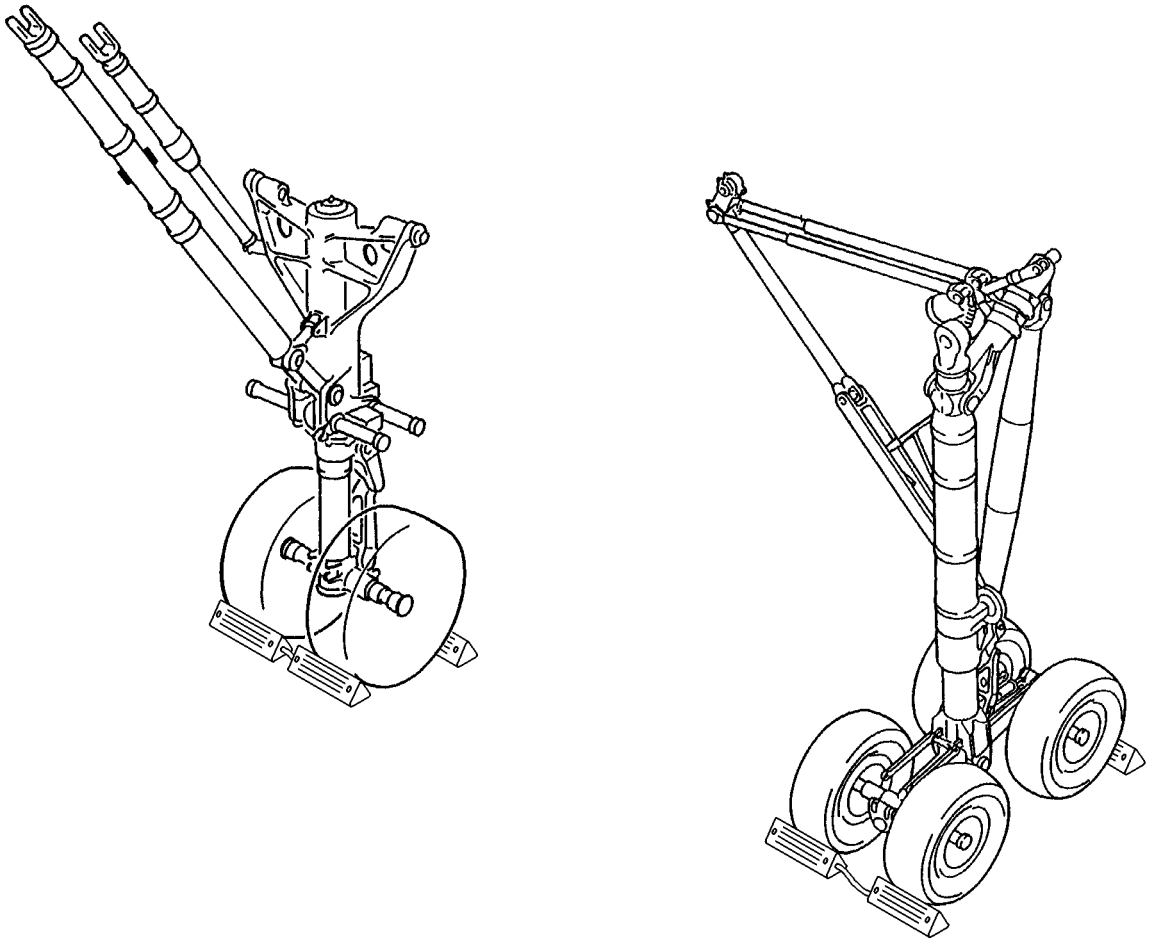
(2)Position wheel chocks (Ref. Fig. 018).
(3)Apply parking brake.

**ON A/C ALL

2. Towing by the Nose Gear with Towbarless Tractor (Ref. Fig. 019)
WARNING : MAKE SURE THAT DURING THE TOWING OPERATION, NO PERSONS GO WHERE THE AIRCRAFT CAN CAUSE THEM INJURY.
CAUTION : WHEN YOU USE A TOWBARLESS TRACTOR, MAKE SURE THAT YOU OBEY FULLY ALL THE INSTRUCTIONS IN THIS PROCEDURE. IF YOU DO NOT, THE TRACTOR CAN CAUSE IMPORTANT SCRAPING OR OTHER DAMAGE TO THE NLG AND TO THE



Tow Bar Disconnection
Figure 017



GENERAL DESCRIPTION OF WHEEL CHOCKS

WIDTH: THE WIDTH OF THE CHOCKS MUST BE SUFFICIENT FOR THE AIRCRAFT TIRES ON WHICH THE CHOCKS ARE INSTALLED (ONE WHEEL OR MORE ON ONE AXLE)

HEIGHT: THE SIZE OF THE CHOCKS MUST BE SUFFICIENT TO PREVENT MOVEMENT OF THE TIRE. THE CHOCK HEIGHT MUST AGREE WITH THE TIRE SIZE.

WEIGHT: THE WEIGHT OF THE CHOCKS MUST BE SUFFICIENT TO PREVENT THEIR MOVEMENT. STRONG WINDS OR JET BLAST MUST NOT BLOW THEM AWAY.

NOTE: FOR MORE INFORMATION ON THE WHEEL CHOCK DESIGN, REFER TO SAE AIR4905.

BM5 09 11 00 0 GAM0 00

Typical Installation of Wheel Chocks
Figure 018

AIRFRAME STRUCTURE AROUND THE NLG.

This procedure is for towing of the aircraft in maintenance configuration. It is also permitted to use this procedure to disengage the aircraft from the gate area in these conditions:

. A push back with one or several turns or stops and starts and
. A forward tow without turns or multiple stops/starts.

NOTE : Operational towing, i.e. towing an aircraft, loaded with passengers, fuel, and cargo, from the terminal gate or parking area, to a remote location is not permitted.

NOTE : For aircraft with cabin and/or cargo compartment(s) floor panels removed, smooth and low-speed towing is recommended.

A. General

When this towing procedure is applied, the aircraft is towed by the nose gear, without a towbar.
The nose gear is jacked up and positioned at the appropriate location on the tractor. It is held in place by means of a nose gear wheel locking system.

**ON A/C 226-226, 229-249,

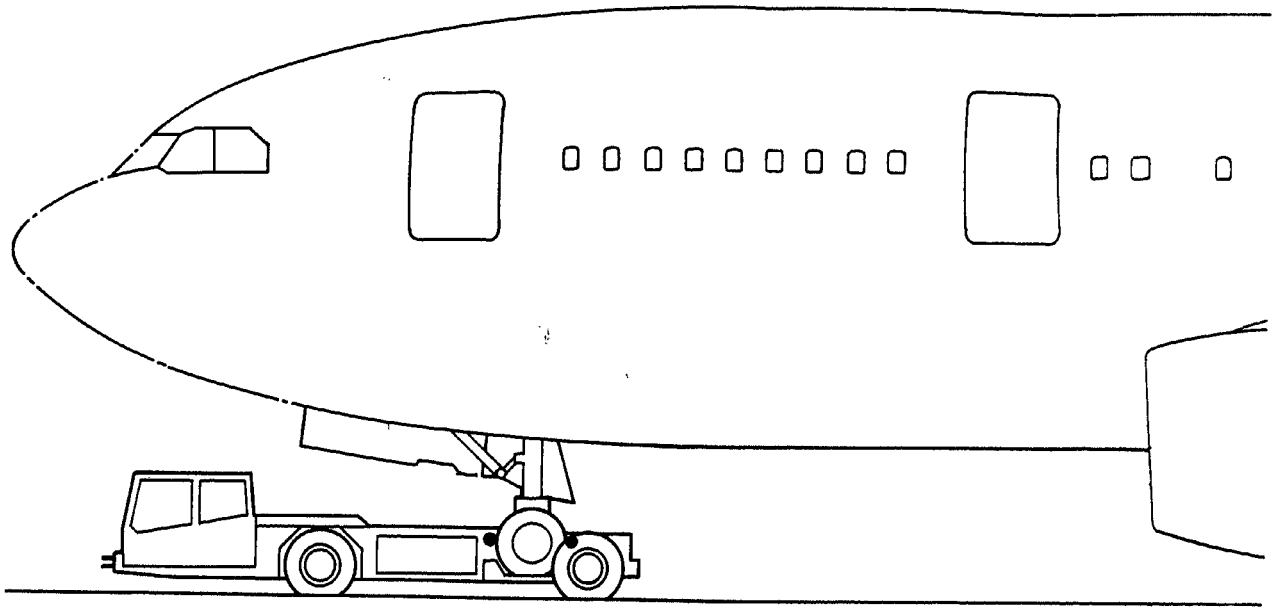
(1)Equipment and Materials

ITEM	DESIGNATION
(1)	Wheel Chocks
(2)D22333000	Ground Safety Pin MLG
(3)C23157-0-1	Ground Safety Pin NLG
(4)	Special Tractor
(5)C22646	Safety Pin
Referenced Procedures	
- 05-51-22, P. Block 1	Inspection after NLG Towing Overload or Overrun
- 05-57-00, P. Block 1	Aircraft Stability
- 24-23-00, P. Block 301	Auxiliary AC Generation
- 24-41-00, P. Block 301	AC External Power Control
- 29-23-00, P. Block 301	Yellow Auxiliary Power (Power Tranfer Unit)
- 32-00-00, P. Block 301	Landing Gear - GENERAL
- 80-00-00, P. Block 201	Starting - General

(2)Qualification of the tractor

NOTE : Towbarless tractors are subject to specific qualification procedure. Before towing be sure that the tractor is qualified for towbarless towing for this A/C. For more information on the towbarless tractors, refer to the SIL 09-002.

CAUTION : THE LANDING GEAR BRACE STRUT LOCKING DEVICES MUST ALWAYS BE FITTED WHEN THE AIRCRAFT IS ON THE GROUND OR BEING TOWED. USE ONLY TOWING EQUIPMENT DESIGNED OR APPROVED BY THE AIRCRAFT MANUFACTURER.



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Towing by the Nose Gear
Figure 019

B. Precautions

WARNING : OBEY THESE SAFETY PRECAUTIONS DURING MOVEMENT OF THE AIRCRAFT (TOWING, PUSHBACK OR TAXIING).
MAKE SURE THAT:
- THE PATH OF THE AIRCRAFT IS CLEAR OF PERSONS, EQUIPMENT OR OTHER OBSTACLES,
- NO PERSONS GO NEAR THE TOW TRACTOR, TOWBAR, LANDING GEARS, ENGINE NACELLES OR BELOW THE AIRCRAFT FUSELAGE,
- ONLY QUALIFIED PERSONS ARE ON THE TRACTOR AND NO PERSONS SIT OR STAND ON THE TOWBAR,
- NO PERSONS GO NEAR THE AIRCRAFT BEFORE IT IS FULLY STOPPED.

THERE IS A RISK OF INJURY OR DEATH IF YOU DO NOT OBEY THESE INSTRUCTIONS.

WARNING : BEFORE POSITIONING THE NOSE GEAR ON THE TRACTOR, THE NOSE WHEEL STEERING SYSTEM MUST BE DEACTIVATED BY USING SAFETY PIN C22646.

WARNING : BEFORE POSITIONING THE LOCKING DEVICES, MAKE CERTAIN THAT THE LANDING GEAR IS DOWNLOCKED (REF. 32-00-00, P. BLOCK 301).

WARNING : DURING TOWING/TAXIING OPERATIONS (LOW-SPEED OPERATIONS INCLUDED), EACH PERSON IN THE AIRCRAFT MUST BE IN A SEAT AND THE SEAT BELT MUST BE FASTENED.
IF THE SEAT BELT IS NOT FASTENED, THERE IS A RISK OF INJURY IF THE AIRCRAFT STOPS SUDDENLY.

CAUTION : TOWING THE AIRCRAFT WITH ENGINE COWLINGS OPEN IS SPECIFICALLY FORBIDDEN DUE TO POSSIBILITY OF DAMAGE TO COWLS AND NACELLE STRUCTURE. ALL COWLS (FAN, REVERSER AND CORE) MUST BE CLOSED AND LATCHED, PRIOR TO TOWING.

C. Towing Preparation

R **ON A/C 401-401, 404-500,

(1)Equipment and Materials

ITEM	DESIGNATION
(1)	Wheel Chocks
(2)D22333000	Ground Safety Pin MLG
(3)C23157-0-1	Ground Safety Pin NLG
(4)	Special Tractor
(5)C22646	Safety Pin
Referenced Procedures	
- 05-51-22, P. Block 1	Inspection after NLG Towing Overload or Overrun
- 05-57-00, P. Block 1	Aircraft Stability
- 24-23-00, P. Block 301	Auxiliary AC Generation
- 24-41-00, P. Block 301	AC External Power Control
- 29-23-00, P. Block 301	Yellow Auxiliary Power (Power Tranfer Unit)
- 32-00-00, P. Block 301	Landing Gear - GENERAL
- 80-00-00, P. Block 201	Starting - General

(2)Qualification of the tractor

NOTE : Towbarless tractors are subject to specific qualification procedure. Before towing be sure that the tractor is qualified for towbarless towing for this A/C. For more information on the towbarless tractors, refer to the SIL 09-002.

CAUTION : THE LANDING GEAR BRACE STRUT LOCKING DEVICES MUST ALWAYS BE FITTED WHEN THE AIRCRAFT IS ON THE GROUND OR BEING TOWED. USE ONLY TOWING EQUIPMENT DESIGNED OR APPROVED BY THE AIRCRAFT MANUFACTURER.

B. Precautions

WARNING : OBEY THESE SAFETY PRECAUTIONS DURING MOVEMENT OF THE AIRCRAFT (TOWING, PUSHBACK OR TAXIING).
MAKE SURE THAT:
- THE PATH OF THE AIRCRAFT IS CLEAR OF PERSONS, EQUIPMENT OR OTHER OBSTACLES,
- NO PERSONS GO NEAR THE TOW TRACTOR, TOWBAR, LANDING GEARS, ENGINE NACELLES OR BELOW THE AIRCRAFT FUSELAGE,
- ONLY QUALIFIED PERSONS ARE ON THE TRACTOR AND NO PERSONS SIT OR STAND ON THE TOWBAR,
- NO PERSONS GO NEAR THE AIRCRAFT BEFORE IT IS FULLY STOPPED.

THERE IS A RISK OF INJURY OR DEATH IF YOU DO NOT OBEY THESE INSTRUCTIONS.

WARNING : BEFORE POSITIONING THE NOSE GEAR ON THE TRACTOR, THE NOSE WHEEL STEERING SYSTEM MUST BE DEACTIVATED BY USING SAFETY PIN C22646.

WARNING : BEFORE POSITIONING THE LOCKING DEVICES, MAKE CERTAIN THAT THE LANDING GEAR IS DOWNLOCKED (REF. 32-00-00, P. BLOCK 301).

WARNING : DURING TOWING/TAXIING OPERATIONS (LOW-SPEED OPERATIONS INCLUDED), EACH PERSON IN THE AIRCRAFT MUST BE IN A SEAT AND THE SEAT BELT MUST BE FASTENED.
IF THE SEAT BELT IS NOT FASTENED, THERE IS A RISK OF INJURY IF THE AIRCRAFT STOPS SUDDENLY.

CAUTION : TOWING THE AIRCRAFT WITH ENGINE COWLINGS OPEN IS SPECIFICALLY FORBIDDEN DUE TO POSSIBILITY OF DAMAGE TO COWLS AND NACELLE STRUCTURE. ALL COWLS (FAN, REVERSER AND CORE) MUST BE CLOSED AND LATCHED, PRIOR TO TOWING.

C. Towing Preparation

**ON A/C 401-401, 404-500,

R Post SB 32-2068 For A/C 401-401,404-500,

(1)Equipment and Materials

ITEM	DESIGNATION
(1)	Wheel Chocks
(2)D22333000	Ground Safety Pin MLG
(3)C23157 100-1	Ground Safety Pin NLG

ITEM	DESIGNATION
(4)	Special Tractor
(5)C22646	Safety Pin
Referenced Procedures	
- 05-51-22, P. Block 1	Inspection after NLG Towing Overload or Overrun
- 05-57-00, P. Block 1	Aircraft Stability
- 24-23-00, P. Block 301	Auxiliary AC Generation
- 24-41-00, P. Block 301	AC External Power Control
- 29-23-00, P. Block 301	Yellow Auxiliary Power (Power Transfer Unit)
- 32-00-00, P. Block 301	Landing Gear - General
- 80-00-00, P. Block 201	Starting - General

(2)Qualification of the tractor

NOTE : Towbarless tractors are subject to specific qualification procedure. Before towing be sure that the tractor is qualified for towbarless towing for this A/C. For more information on the towbarless tractors, refer to the SIL 09-002.

CAUTION : THE LANDING GEAR BRACE STRUT LOCKING DEVICES MUST ALWAYS BE FITTED WHEN THE AIRCRAFT IS ON THE GROUND OR BEING TOWED. USE ONLY TOWING EQUIPMENT DESIGNED OR APPROVED BY THE AIRCRAFT MANUFACTURER.

B. Precautions

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- THE PATH OF THE AIRCRAFT IS CLEAR OF PERSONS, EQUIPMENT OR OTHER OBSTACLES,
- NO PERSONS GO NEAR THE TOW TRACTOR, TOWBAR, LANDING GEARS, ENGINE NACELLES OR BELOW THE AIRCRAFT FUSELAGE,
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THERE IS A RISK OF INJURY OR DEATH IF YOU DO NOT OBEY THESE INSTRUCTIONS.

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WARNING : BEFORE POSITIONING THE LOCKING DEVICES, MAKE CERTAIN THAT THE LANDING GEAR IS DOWNLOCKED (REF. 32-00-00, P. BLOCK 301).

WARNING : DURING TOWING/TAXIING OPERATIONS (LOW-SPEED OPERATIONS INCLUDED), EACH PERSON IN THE AIRCRAFT MUST BE IN A SEAT AND THE SEAT BELT MUST BE FASTENED.
IF THE SEAT BELT IS NOT FASTENED, THERE IS A RISK OF INJURY IF THE AIRCRAFT STOPS SUDDENLY.

CAUTION : TOWING THE AIRCRAFT WITH ENGINE COWLINGS OPEN IS SPECIFICALLY FORBIDDEN DUE TO POSSIBILITY OF DAMAGE TO COWLS AND NACELLE STRUCTURE. ALL COWLS (FAN, REVERSER AND CORE) MUST BE CLOSED AND LATCHED, PRIOR TO TOWING.

C. Towing Preparation

R **ON A/C ALL

(1)Landing gear safety pins (Ref. Fig. 004, 020, 007)

**ON A/C 401-401, 404-500,

R Post SB 32-2068 For A/C 401-401,404-500,

(1)Landing gear safety pins (Ref. Fig. 005, 020, 007)

**ON A/C ALL

WARNING : BEFORE INSTALLING THE GROUND SAFETY PINS MAKE CERTAIN THAT THE LANDING GEAR IS DOWNLOCKED.
- IN FLIGHT COMPARTMENT, ON PANELS 400VU and 76VU, LH, NOSE, RH GREEN ARROWS ARE ON.
- DOWNLOCK VISUAL INDICATORS ARE VISIBLE ON WINGS (MAIN GEAR) AND ON TELESCOPIC DRAG STRUT (NOSE GEAR).

The landing gear must be mechanically secured in downlocked position during towing operation by inserting ground safety pins.

WARNING : WHENEVER THE GROUND SAFETY PIN IS INSTALLED ON THE NOSE GEAR TELESCOPIC STRUT ALWAYS VISUALLY CHECK THAT :
- IT HAS COMPLETELY AND EASILY ROTATED THE FORK-TYPE LEVER OF THE GROUND LOCKING SYSTEM.
- ITS STOP FLANGE ABUTS AGAINST THE HOUSING OF THE TELESCOPIC STRUT LOCKING SYSTEM (FULL INSERTION).

WARNING : WHEN THE GROUND SAFETY PIN IS REMOVED, VISUALLY CHECK THE DOWN POSITION OF THE FORK-TYPE LEVER ON THE TELESCOPIC STRUT GROUND LOCKING SYSTEM.

NOTE : It is optional to install the landing gear safety devices when you tow or push the aircraft during flight operations. (To put the aircraft in position for the flight crew at arrival or departure).

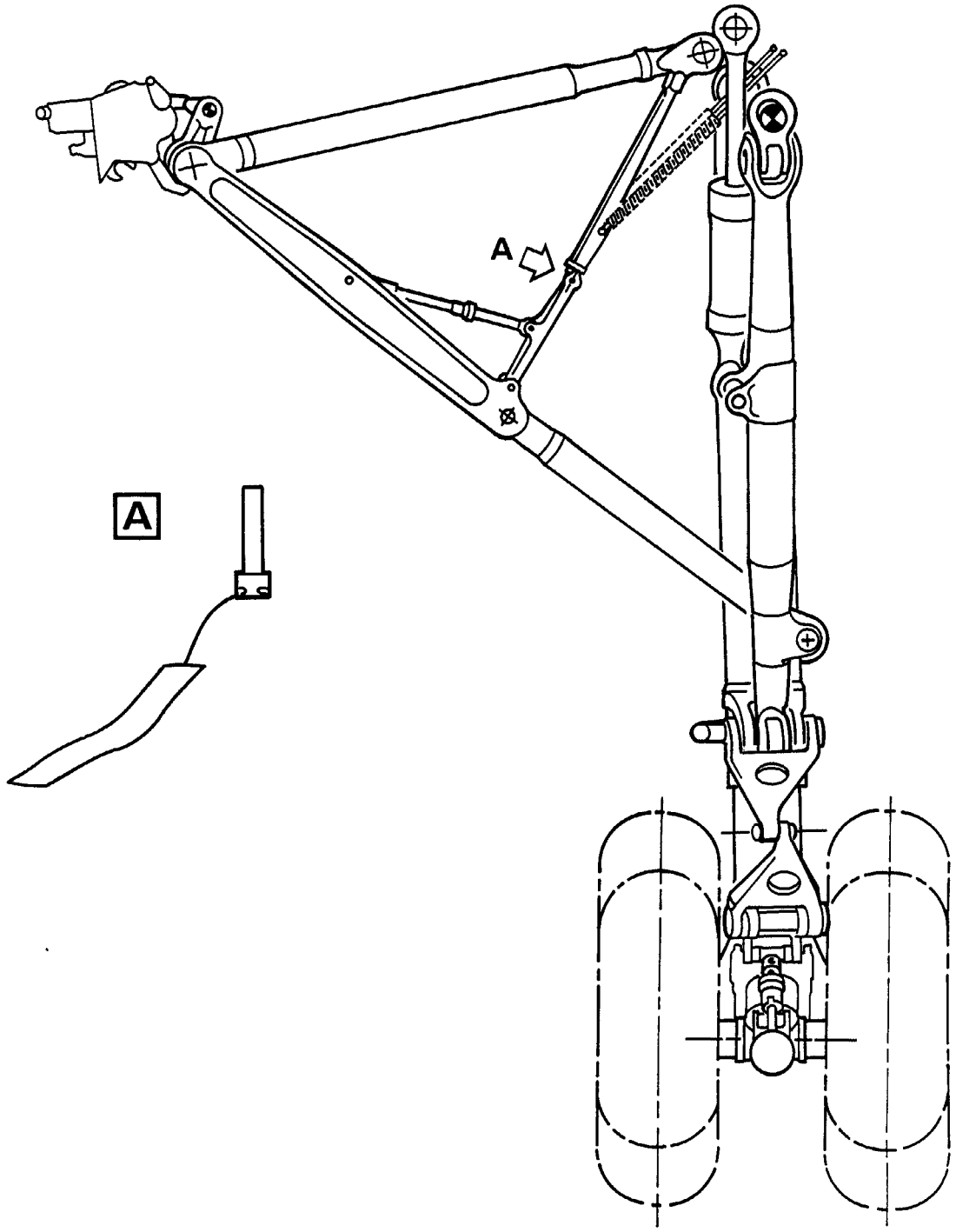
(2)Make sure that the aircraft is stable (Ref. 05-57-00, P. Block 1).

(3)Ground crew interphone box (Ref. Fig. 021)
For towing purposes the nose wheel steering system must be deactivated. This is carried out by a two position towing lever which must be set in the towing position and locked by a safety pin.

(4)Towing angles
The maximum angle allowed on each side of the aircraft center line is 95° whatever towing arrangement is used (Ref. Fig. 022).

R **ON A/C 404-500,

WARNING : IF THE AIRCRAFT WEIGHT EXCEEDS 158T, STEERING ANGLE IS LIMITED TO 65°.



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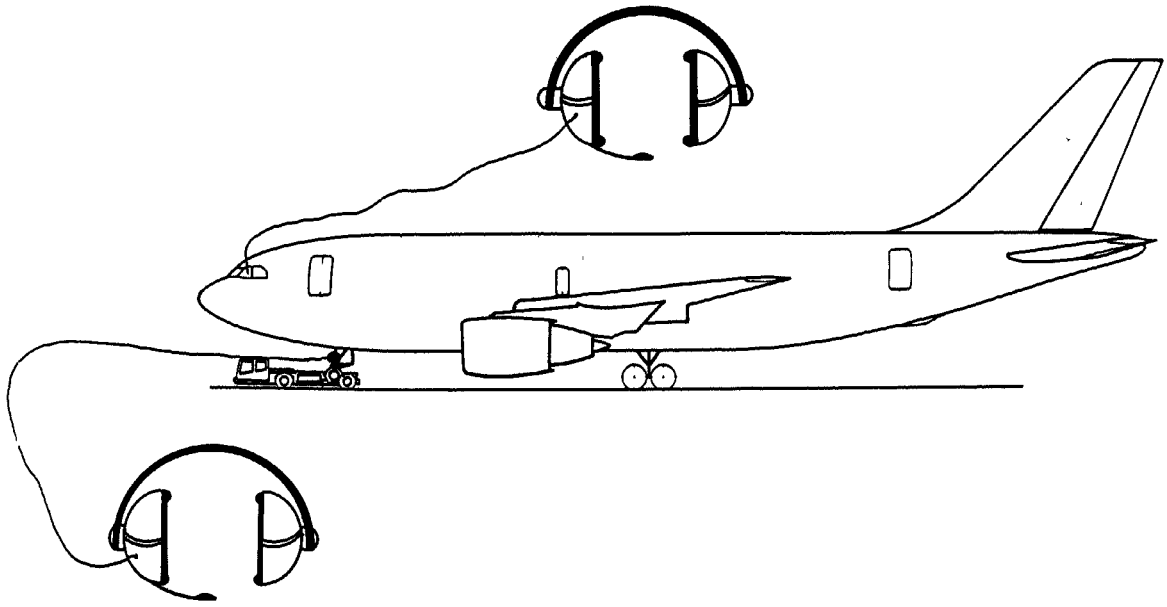
Main Landing Gear Safety Pins
Figure 020



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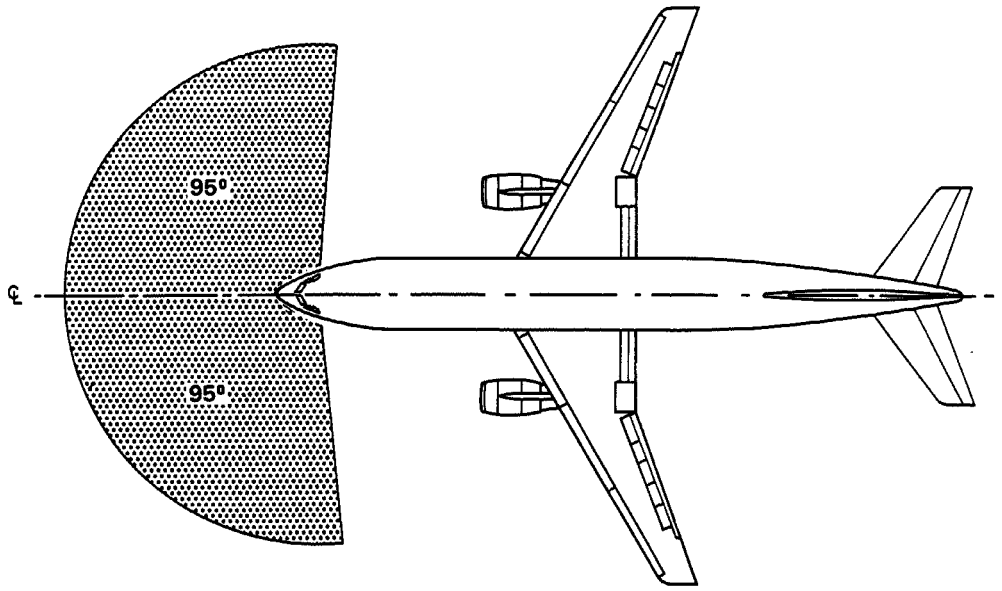
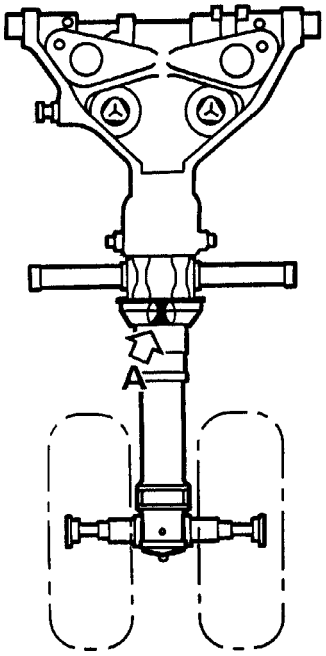
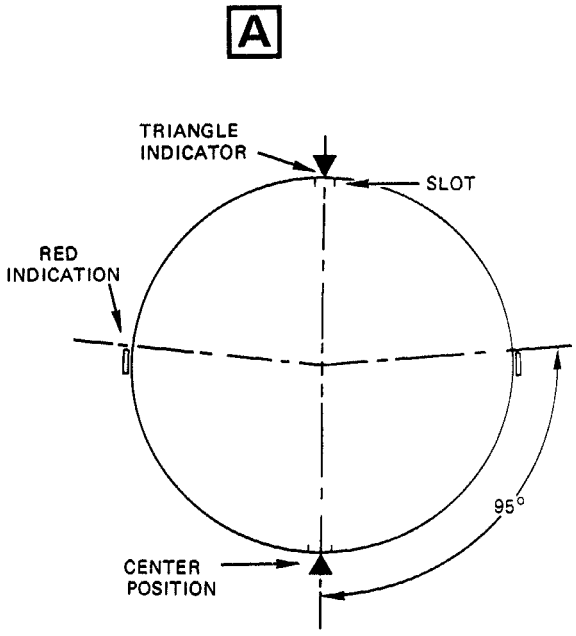
Flight Interphone System
Figure 021







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Towing Angles
Figure 022

**ON A/C ALL

(5)Towing loads
- Four fixed indicators are located on the nose landing gear. The center position is indicated by a forward and a rear slot.

(a)Towing load applied to nose gear must not exceed 16,555 daN. (37217.11 lb.ft).

**ON A/C 226-226, 229-249,

(b)Torque applied to nose gear must not exceed 1750 m.daN (12900 lbf.ft.).

(6)Energize the aircraft electrical network
During towing operations several aircraft systems have to be electrically supplied.
Before supplying the aircraft electrical network, the cockpit safety check must be performed.

(a)With the tractor (if the tractor is equipped with a GPU) (Ref. Fig. 023)
- open access door 121EL
- connect a ground power unit provided on the tractor to a ground power receptacle located underneath the fuselage aft of the nose gear well
- energize the aircraft electrical network (Ref. 24-41-00, P. Block 301).

(b)Or with the APU
- energize the aircraft electrical network (Ref. 24-41-00, P. Block 301).

(c)Or with the engine
- start engine 2 (Ref. 80-00-00, P. Block 301).

R **ON A/C 401-401, 404-500,

(b)Torque applied to nose gear must not exceed 1750 m.daN (12900 lbf.ft.).

(6)Energize the aircraft electrical network
During towing operations several aircraft systems have to be electrically supplied.
Before supplying the aircraft electrical network, the cockpit safety check must be performed.

(a)With the tractor (if the tractor is equipped with a GPU) (Ref. Fig. 023)
- open access door 121EL
- connect a ground power unit provided on the tractor to a ground power receptacle located underneath the fuselage aft of the nose gear well
- energize the aircraft electrical network (Ref. 24-41-00, P. Block 301).

(b)Or with the APU
- energize the aircraft electrical network (Ref. 24-41-00, P. Block 301).

(c)Or with the engine
- start engine 2 (Ref. 80-00-00, P. Block 201).

**ON A/C ALL

(7)Lighting system
If necessary, the cockpit DOME lights must be switched ON.
At night, if the anti-collision lighting is required by local airport regulations or by airline procedures the BEACON/STROBE lighting must be turned ON.

(8)Landing gear and brake system (Ref. Fig. 024)
WARNING : WHEN YOU TOW THE AIRCRAFT WITH A TOWBARLESS TRACTOR,
THE PARKING BRAKE OR THE BRAKE PEDALS SHALL ONLY
BE USED IN CASE OF EMERGENCY.
IF YOU APPLY THE PARKING BRAKE OR THE BRAKE PEDALS,
YOU CAN CAUSE:
- OVERLOAD TO THE NOSE LANDING GEAR
- DAMAGE TO THE TOWBARLESS TRACTOR
- INJURY TO MAINTENANCE PERSONNEL
IF THIS OCCURS, YOU MUST REFER TO AIRBUS.

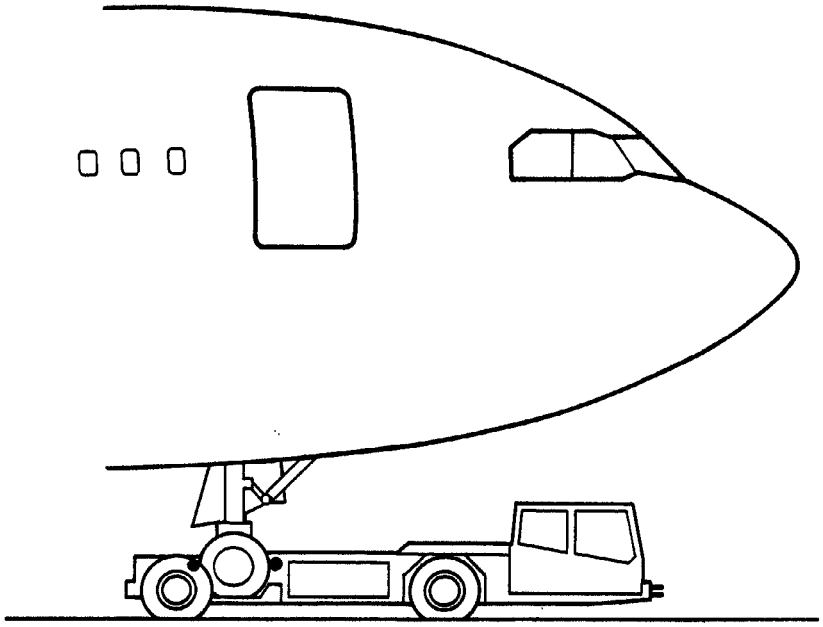
- During towing maneuvers, one person shall be in the flight compartment in order to operate the brakes, if required.
- Before the breakaway, release the brakes and make sure that on the panel 4VU, the pressure indication on the yellow brake pressure triple indicator is correct (3000 psi (206 bars)). The pointer must be in the green zone.
The 3000 psi (206 bars) pressure permits seven brake applications.
- If necessary, pressurize the yellow hydraulic system (Ref. 29-23-00, P. Block 301).
- Pressurize the yellow hydraulic system during towing operations (Ref. 29-23-00, P. Block 301).

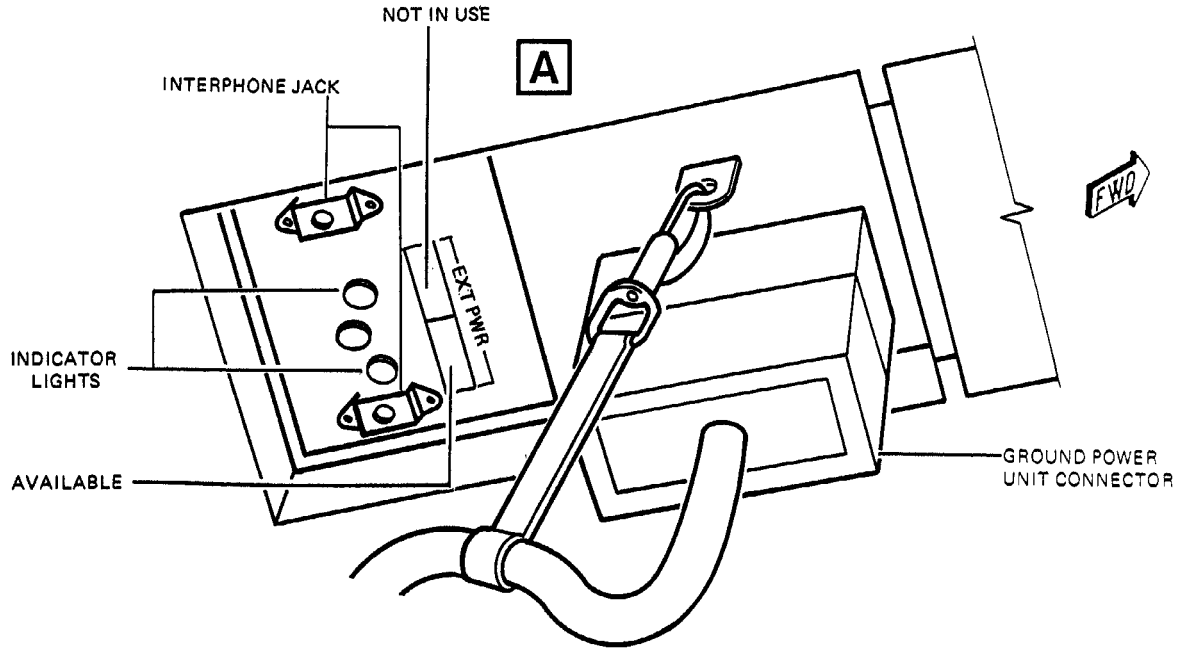
NOTE : If you energized the aircraft electrical network with the engine, do not pressurize the yellow hydraulic system.

(9)Communication systems
(a)VHF system (Ref. Fig. 025)
If communication between the aircraft and the control tower is necessary, the VHF communication system No. 1 must be activated.

(Ref. Fig. 026)

(b)Flight interphone system (Ref. Fig. 021)
During the towing operation, the flight interphone system must be used providing communication between the flight compartment and the ground crew.
The ground crew boomset connection is located in the electric ground power receptacle aft of the nose landing gear well.





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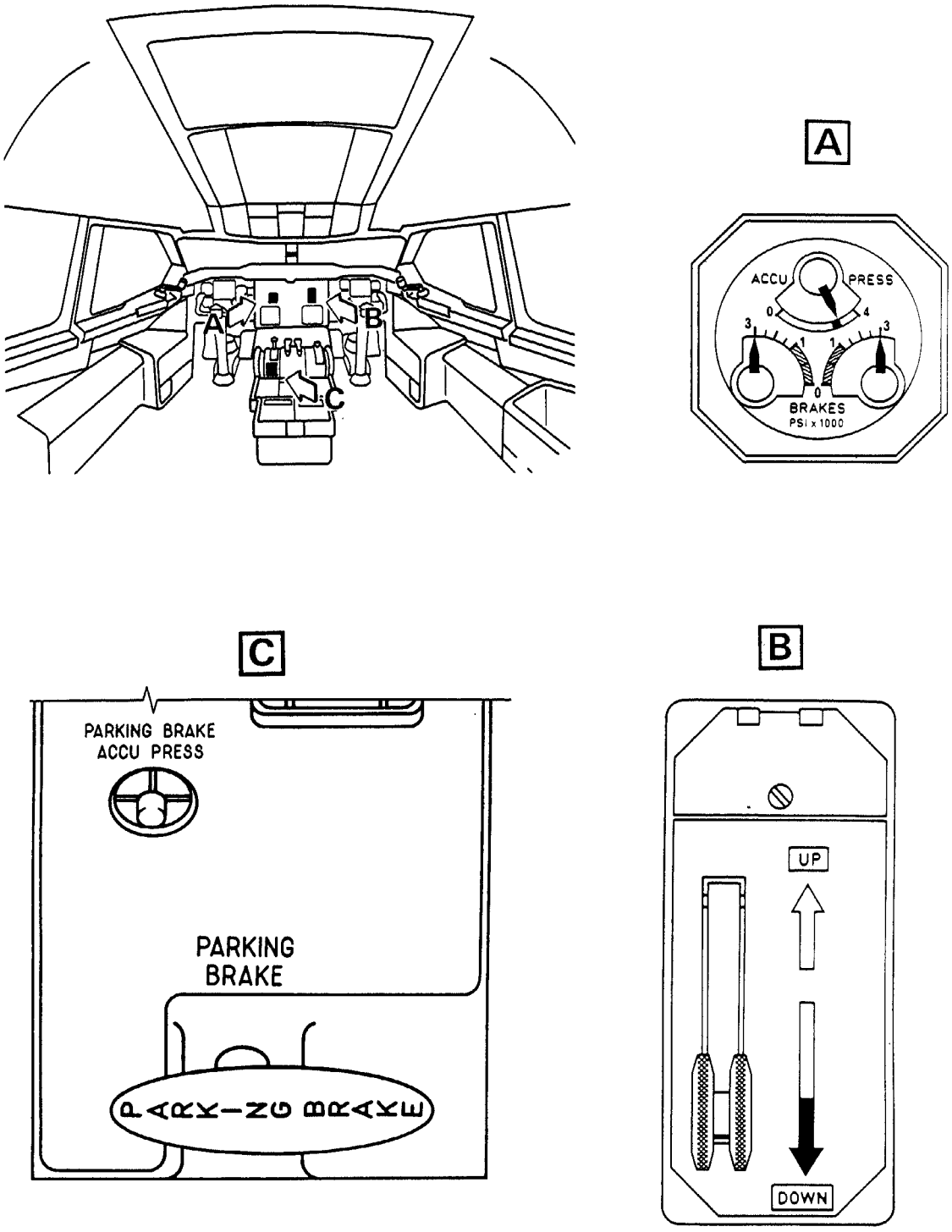
Electrical Supply
Figure 023



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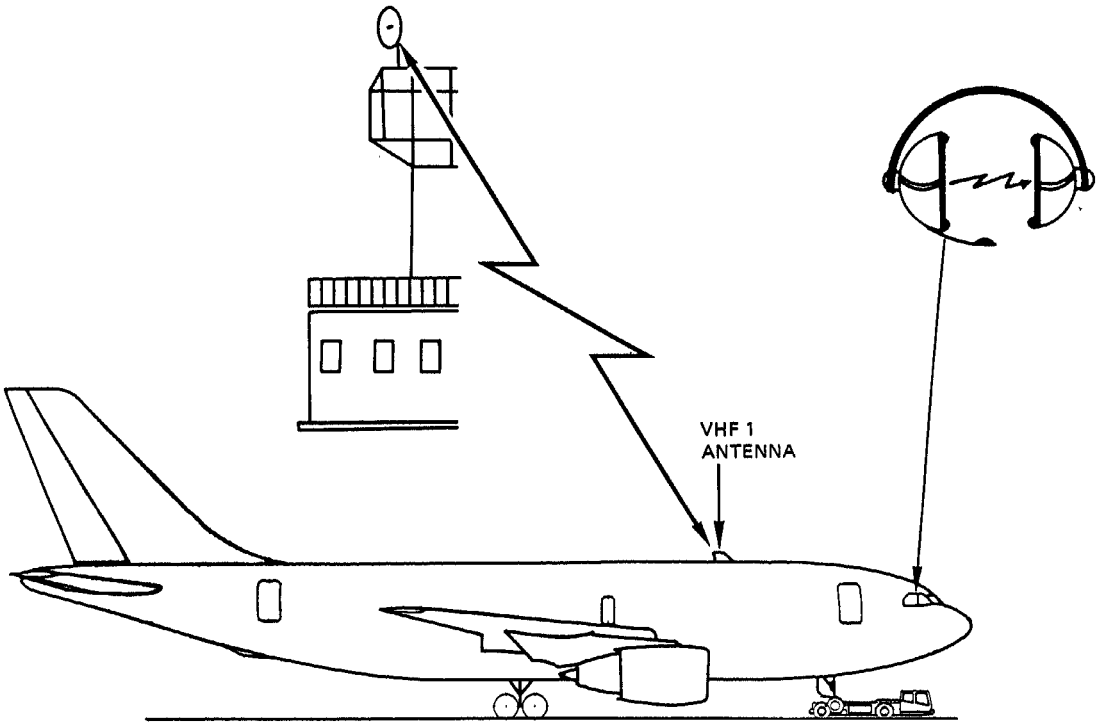
Landing Gear and Brake System
Figure 024



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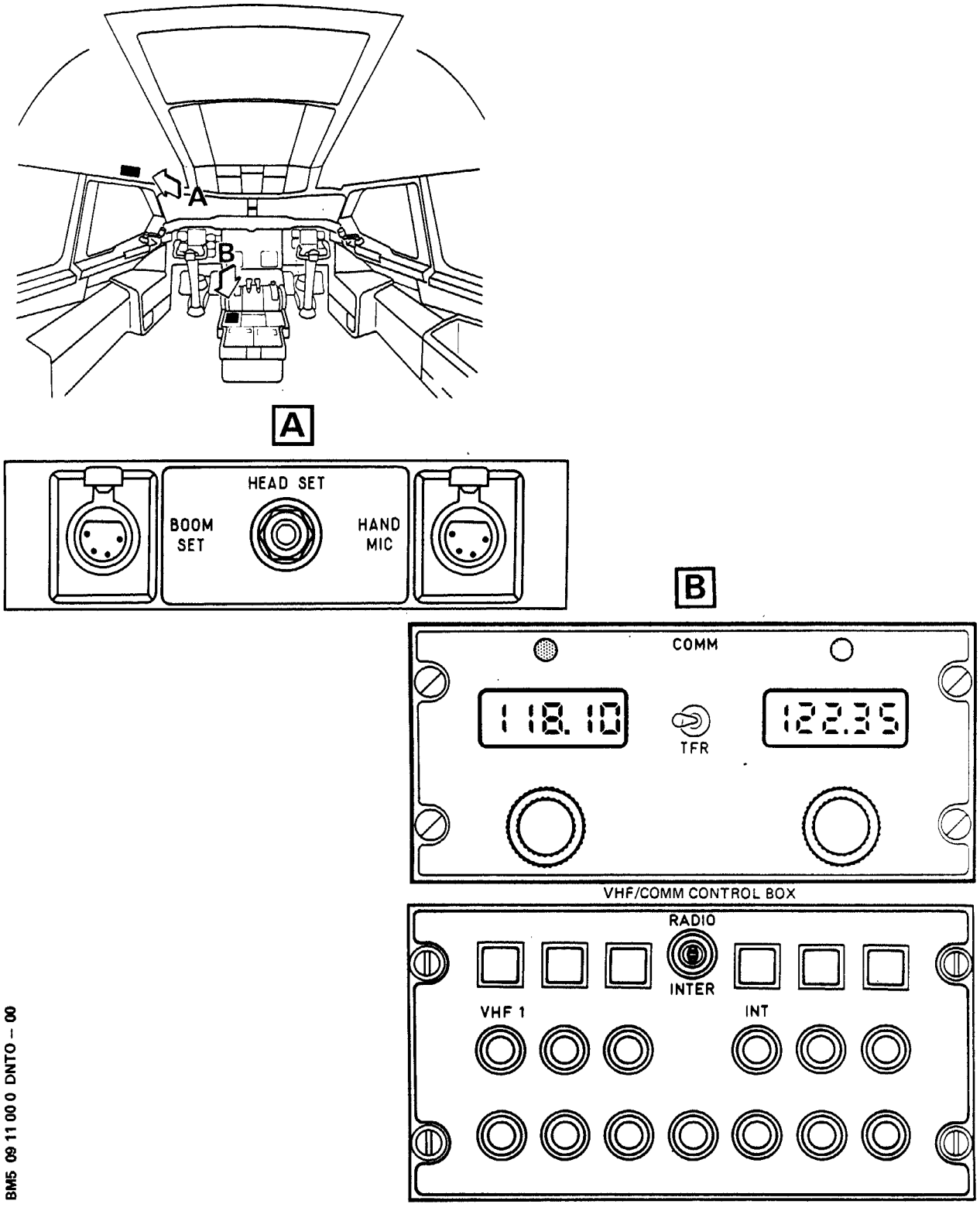
VHF System
Figure 025



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VHF System Controls
Figure 026

D. Towing Operation
(1)Select the A/C type on the towbarless tractor if necessary.
(2)Load NLG on the towbarless tractor.
WARNING : MAKE SURE THAT NLG CANNOT BE DISENGAGED FROM THE TRACTOR.
CAUTION : WHEN YOU PUT THE NOSE LANDING GEAR ON THE TRACTOR, BE CAREFUL TO ALIGN THE CLAMPING DEVICE OF THE TRACTOR WITH THE NLG AXIS. THE GAP BETWEEN THE CRADLE AND THE TORQUE LINK IS VERY SMALL. THUS, IF YOU DO NOT ALIGN THE CLAMPING DEVICE WITH THE NLG AXIS, THERE IS A RISK OF DAMAGE TO THE TORQUE LINK PIN.
(3)Towing
Normal towing operation should only be carried out on suitable ground surfaces.
Shock absorber reaction tends to induce a rocking movement after the aircraft is stopped. Consequently sufficient spare must be left around the aircraft for all nose gear towing maneuvers. Towing should be carried out slowly and smoothly.
Speed limits :
- Doors closed and locked or removed, for a tractor without a tow bar, a maximum speed of 32 km/h (19.8 mph) is permitted.
- Passenger/crew doors fully open and locked and/or cargo doors open in vertical position, a maximum speed of 10 km/h (6.21 mph) is permitted.

On interphone box 3WC, position towing control lever in "towing" position and lock lever by installing safety pin C22646 (Ref. Fig. 027).

**ON A/C 226-226, 229-249,

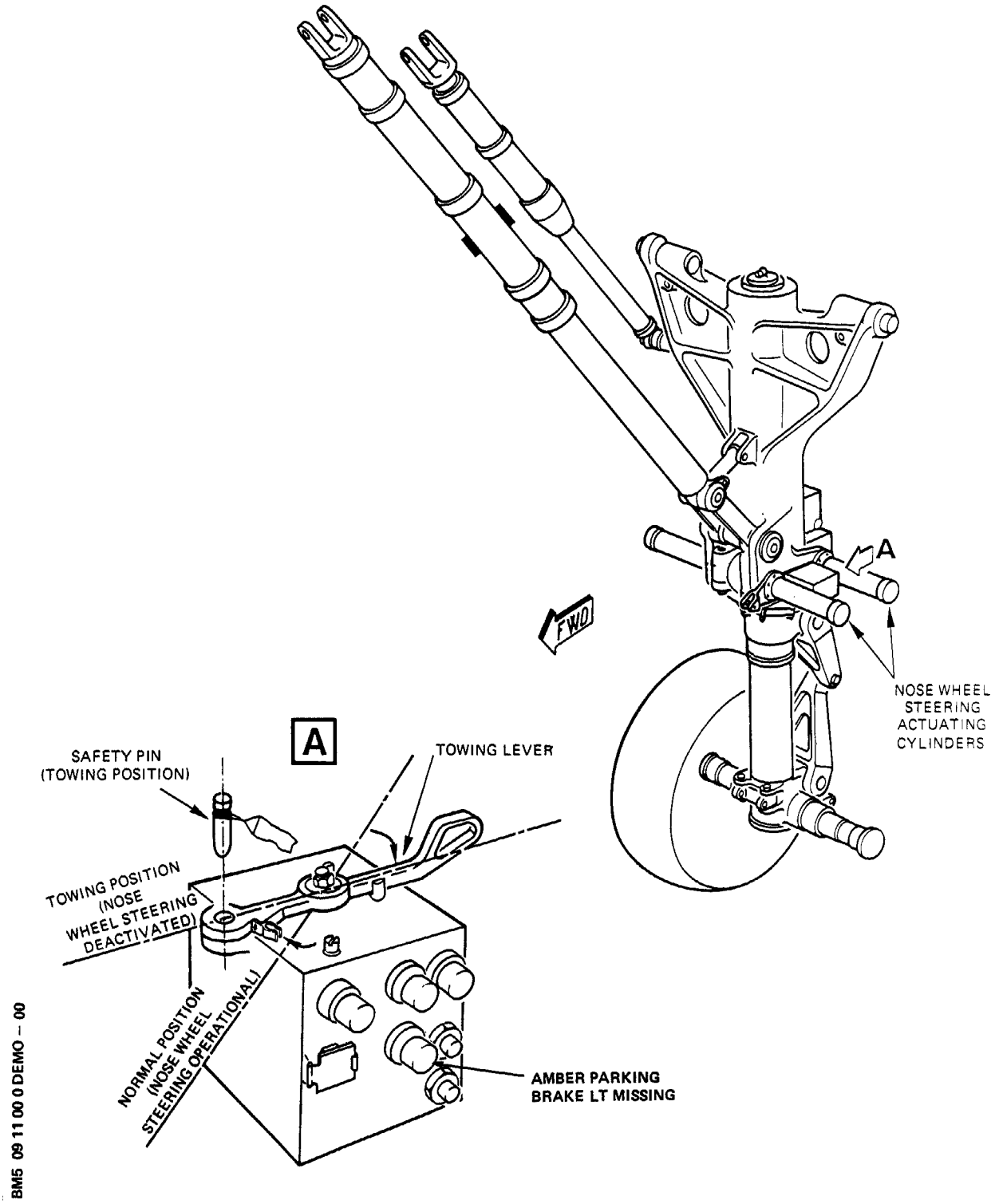
E. Close-Up
NOTE : It is advisable to stop with the nose wheels in the aircraft centerline.
(1)De-energize the aircraft electrical circuits
(a)If you energized with the tractor (Ref. Fig. 023)
- de-energize the aircraft electrical network (Ref. 24-41-00, P. Block 301)
- disconnect ground power unit provided on the tractor from ground power receptacle located underneath the fuselage aft of the nose gear well
- close access door 121EL.

(b)If you energized with the APU
- de-energize the aircraft electrical network (Ref. 24-23-00, P. Block 301).

(c)If you energized with the engine
- stop engine 2 (Ref. 80-00-00, P. Block 301).

(2)Position wheel chocks (Ref. Fig. 018).
(3)Apply parking brake.
(4)Unload the NLG from the towbarless tractor.
(5)Remove safety pin and ensure that control lever is in "normal" position.

R **ON A/C 401-401, 404-500,



Interphone Box
Figure 027

E. Close-Up

NOTE : It is advisable to stop with the nose wheels in the aircraft centerline.

(1)De-energize the aircraft electrical circuits

(a)If you energized with the tractor (Ref. Fig. 023)

- de-energize the aircraft electrical network (Ref. 24-41-00, P. Block 301)
- disconnect ground power unit provided on the tractor from ground power receptacle located underneath the fuselage aft of the nose gear well
- close access door 121EL.

(b)If you energized with the APU

- de-energize the aircraft electrical network (Ref. 24-23-00, P. Block 301).

(c)If you energized with the engine

- stop engine 2 (Ref. 80-00-00, P. Block 201).

(2)Position wheel chocks (Ref. Fig. 018).

(3)Apply parking brake.

(4)Unload the NLG from the towbarless tractor.

(5)Remove safety pin and ensure that control lever is in "normal" position.

**ON A/C ALL

3. Towing by the Main Landing Gear

WARNING : MAKE SURE THAT WHEN THE AIRCRAFT MOVES WITH ITS POWER ON THE GROUND:

- NO PERSONS GO WHERE THE AIRCRAFT CAN CAUSE THEM INJURY OR CAN KILL THEM
- NO OBJECTS STAY WHERE THE ENGINES CAN BLOW THEM AWAY OR CAN PULL THEM INTO THE ENGINES BY SUCTION.

CAUTION : DO NOT TOW OR MOVE THE AIRCRAFT ON THE GROUND IF THE ENGINE COWLS ARE OPEN.
MOVEMENT OF THE AIRCRAFT WITH THE COWLS OPEN CAN CAUSE DAMAGE TO THE COWLS AND THE NACELLE STRUCTURE.

A. General

Two tow fittings are provided on each main landing gear.
The front fittings are used for forward pulling with the tractor placed in front of the aircraft.
The rear fittings serve for rearward pulling with the tractor placed behind of the aircraft.

(1)Equipment and Materials

ITEM	DESIGNATION
(1)C22646	Safety Pin
(2)C22783	Ground Safety Pin MLG

R

(3)C23157-0-1 Ground Safety Pin NLG

**ON A/C 401-401, 404-500,

R Post SB 32-2068 For A/C 401-401,404-500,

(3)C23157 100-1 Ground Safety Pin NLG

**ON A/C ALL

(4) Movable Taxiway Plates
(5) Special Tractor
(6)98A09003000000 Bar-Steering-Nose Wheel

**ON A/C 226-226, 229-249,

(7)98F09103500000 Cable,Towing-MLG
(8)D22800000 Towing Lifting and Debogging Fittings
Referenced Procedures
- 05-57-00, P. Block 1 Aircraft Stability
- 24-23-00, P. Block 301 Auxiliary AC Generation
- 24-41-00, P. Block 301 AC External Power Control
- 29-23-00, P. Block 301 Yellow Auxiliary Power (Power Transfer Unit)
- 32-00-00, P. Block 301 Landing Gear - General
- 80-00-00, P. Block 301 Starting - General

B. Precautions

WARNING : OBEY THESE SAFETY PRECAUTIONS DURING MOVEMENT OF THE AIRCRAFT (TOWING, PUSHBACK OR TAXIING).
MAKE SURE THAT:
- THE PATH OF THE AIRCRAFT IS CLEAR OF PERSONS, EQUIPMENT OR OTHER OBSTACLES,
- NO PERSONS GO NEAR THE TOW TRACTOR, TOWBAR, LANDING GEARS, ENGINE NACELLES OR BELOW THE AIRCRAFT FUSELAGE,
- ONLY QUALIFIED PERSONS ARE ON THE TRACTOR AND NO PERSONS SIT OR STAND ON THE TOWBAR,
- NO PERSONS GO NEAR THE AIRCRAFT BEFORE IT IS FULLY STOPPED.

THERE IS A RISK OF INJURY OR DEATH IF YOU DO NOT OBEY THESE INSTRUCTIONS.

WARNING : BEFORE POSITIONING THE LOCKING DEVICES, MAKE CERTAIN THAT THE LANDING GEAR IS DOWNLOCKED (REF. 32-00-00, P. BLOCK 301).

WARNING : DURING TOWING/TAXIING OPERATIONS (LOW-SPEED OPERATIONS INCLUDED), EACH PERSON IN THE AIRCRAFT MUST BE IN A SEAT AND THE SEAT BELT MUST BE FASTENED.
IF THE SEAT BELT IS NOT FASTENED, THERE IS A RISK OF INJURY IF THE AIRCRAFT STOPS SUDDENLY.

CAUTION : THE LANDING GEAR BRACE STRUT LOCKING DEVICES MUST ALWAYS BE

FITTED WHEN THE AIRCRAFT IS ON THE GROUND OR BEING TOWED.
USE ONLY TOWING EQUIPMENT DESIGNED OR APPROVED BY THE AIRCRAFT MANUFACTURER.

CAUTION : TOWING THE AIRCRAFT WITH ENGINE COWLINGS OPEN IS SPECIFICALLY FORBIDDEN DUE TO POSSIBILITY OF DAMAGE TO COWLS AND NACELLE STRUCTURE. ALL COWLS (FAN, REVERSER AND CORE) MUST BE CLOSED AND LATCHED, PRIOR TO TOWING.

C. Towing Preparation
(1)Landing gear safety pins

R **ON A/C 401-401, 404-500,

ITEM	DESIGNATION
(7)98F09103500000	Cable,Towing-MLG
(8)D22800000	Towing Lifting and Debogging Fittings
Referenced Procedures	
- 05-57-00, P. Block 1	Aircraft Stability
- 24-23-00, P. Block 301	Auxiliary AC Generation
- 24-41-00, P. Block 301	AC External Power Control
- 29-23-00, P. Block 301	Yellow Auxiliary Power (Power Transfer Unit)
- 32-00-00, P. Block 301	Landing Gear - General
- 80-00-00, P. Block 201	Starting - General

B. Precautions

WARNING : OBEY THESE SAFETY PRECAUTIONS DURING MOVEMENT OF THE AIRCRAFT (TOWING, PUSHBACK OR TAXIING).
MAKE SURE THAT:
- THE PATH OF THE AIRCRAFT IS CLEAR OF PERSONS, EQUIPMENT OR OTHER OBSTACLES,
- NO PERSONS GO NEAR THE TOW TRACTOR, TOWBAR, LANDING GEARS, ENGINE NACELLES OR BELOW THE AIRCRAFT FUSELAGE,
- ONLY QUALIFIED PERSONS ARE ON THE TRACTOR AND NO PERSONS SIT OR STAND ON THE TOWBAR,
- NO PERSONS GO NEAR THE AIRCRAFT BEFORE IT IS FULLY STOPPED.

THERE IS A RISK OF INJURY OR DEATH IF YOU DO NOT OBEY THESE INSTRUCTIONS.

WARNING : BEFORE POSITIONING THE LOCKING DEVICES, MAKE CERTAIN THAT THE LANDING GEAR IS DOWNLOCKED (REF. 32-00-00, P. BLOCK 301).

WARNING : DURING TOWING/TAXIING OPERATIONS (LOW-SPEED OPERATIONS INCLUDED), EACH PERSON IN THE AIRCRAFT MUST BE IN A SEAT AND THE SEAT BELT MUST BE FASTENED.
IF THE SEAT BELT IS NOT FASTENED, THERE IS A RISK OF INJURY IF THE AIRCRAFT STOPS SUDDENLY.

CAUTION : THE LANDING GEAR BRACE STRUT LOCKING DEVICES MUST ALWAYS BE FITTED WHEN THE AIRCRAFT IS ON THE GROUND OR BEING TOWED.
USE ONLY TOWING EQUIPMENT DESIGNED OR APPROVED BY THE AIRCRAFT MANUFACTURER.

CAUTION : TOWING THE AIRCRAFT WITH ENGINE COWLINGS OPEN IS SPECIFICALLY

FORBIDDEN DUE TO POSSIBILITY OF DAMAGE TO COWLS AND NACELLE STRUCTURE. ALL COWLS (FAN, REVERSER AND CORE) MUST BE CLOSED AND LATCHED, PRIOR TO TOWING.

C. Towing Preparation
(1)Landing gear safety pins

R **ON A/C ALL

(Ref. Fig. 004, 006)

**ON A/C 401-401, 404-500,

R Post SB 32-2068 For A/C 401-401,404-500,

(Ref. Fig. 005, 006)

**ON A/C ALL

The landing gear must be mechanically secured in the downlocked position during towing operation by inserting ground safety pins.
WARNING : WHENEVER THE GROUND SAFETY PIN IS INSTALLED ON THE NOSE GEAR TELESCOPIC STRUT, ALWAYS VISUALLY CHECK THAT:
- IT HAS COMPLETELY AND EASILY ROTATED THE FORK-TYPE LEVER OF THE GROUND LOCKING SYSTEM.
- ITS STOP FLANGE ABUTS AGAINST THE HOUSING OF THE TELESCOPIC STRUT LOCKING SYSTEM (FULL INSERTION).

WARNING : WHEN THE GROUND SAFETY PIN IS REMOVED, VISUALLY CHECK THE DOWN POSITION OF THE FORK-TYPE LEVER ON THE TELESCOPIC STRUT GROUND LOCKING SYSTEM.

NOTE : It is optional to install the landing gear safety devices when you tow the aircraft during flight operations.

(2)Landing gear and brake system (Ref. Fig. 013)
- During debogging maneuvers, one person shall be in the flight compartment in order to operate the brakes, if required.
- Before the breakaway, release the brakes and make sure that on the panel 4VU, the pressure indication on the yellow brake pressure triple indicator is correct (3000 psi (206 bars)). The pointer must be in the green zone.

The 3000 psi (206 bars) pressure permits seven brake applications.
- If necessary, pressurize the yellow hydraulic system (Ref. 29-23-00, P. Block 301).
- Pressurize the yellow hydraulic system during towing operations (Ref. 29-23-00, P. Block 301).

NOTE : If you energized the aircraft electrical network with the engine, do not pressurize the yellow hydraulic system.

(3)Make sure that the aircraft is stable (Ref. 05-57-00, P. Block 1).
(4)Ground crew interphone box (Ref. Fig. 008).
For towing purposes, the nose wheel steering system must be deactivated. This is carried out by a two position towing lever which must be set in

the towing position and locked by a safety pin.

(5)Put the tractor, aligned with the aircraft centerline, in front of the aircraft.

(6)If there is mud on the ground put, the movable taxiway plates in position in front of the wheels to make the ground hard.

(7)Install the towing cable.
(Ref. Fig. 028)

(a)Make sure that the **CABLE, TOWING-MLG (98F09103500000)** has a traction shear pin calibrated to 50 000 +0 -3000 daN (112404.5500 +0.0000 -6744.2670 lbf).

(b)Install the **CABLE, TOWING-MLG (98F09103500000)** in the forward fittings or the aft fittings of the main landing gear with the **TOWING LIFTING** and **DEBOGGING FITTING (D22800000)** and the tractor connector.

(c)Install the **BAR-STEERING, NOSE WHEEL (98A09003000000)** in the nose landing gear fitting to manually turn the nose wheels during the towing operation.

**ON A/C 226-226, 229-249,

(8)Energize the aircraft electrical network.
During towing operations, several aircraft systems have to be electrically supplied.
Before supplying the aircraft electrical network, the Cockpit Safety check must be performed.

(a)Energize the aircraft electrical network (Ref. 24-41-00, P. Block 301).

(b)Or with the **APU**:
- energize the aircraft electrical network (Ref. 24-23-00, P. Block 301).

(c)Or with the engine:
- start engine 2 (Ref. 80-00-00, P. Block 301).

(9)Remove the wheel chocks from the main landing gear wheels and nose landing gear wheels.

(10)Lighting System
If necessary, the cockpit **DOME** lights must be switched **ON**.
At night, if the anti-collision lighting is required by local airport regulations or by airline procedures, the **BEACON/STROBE** lighting must be turned **ON**.

(11)Communication systems

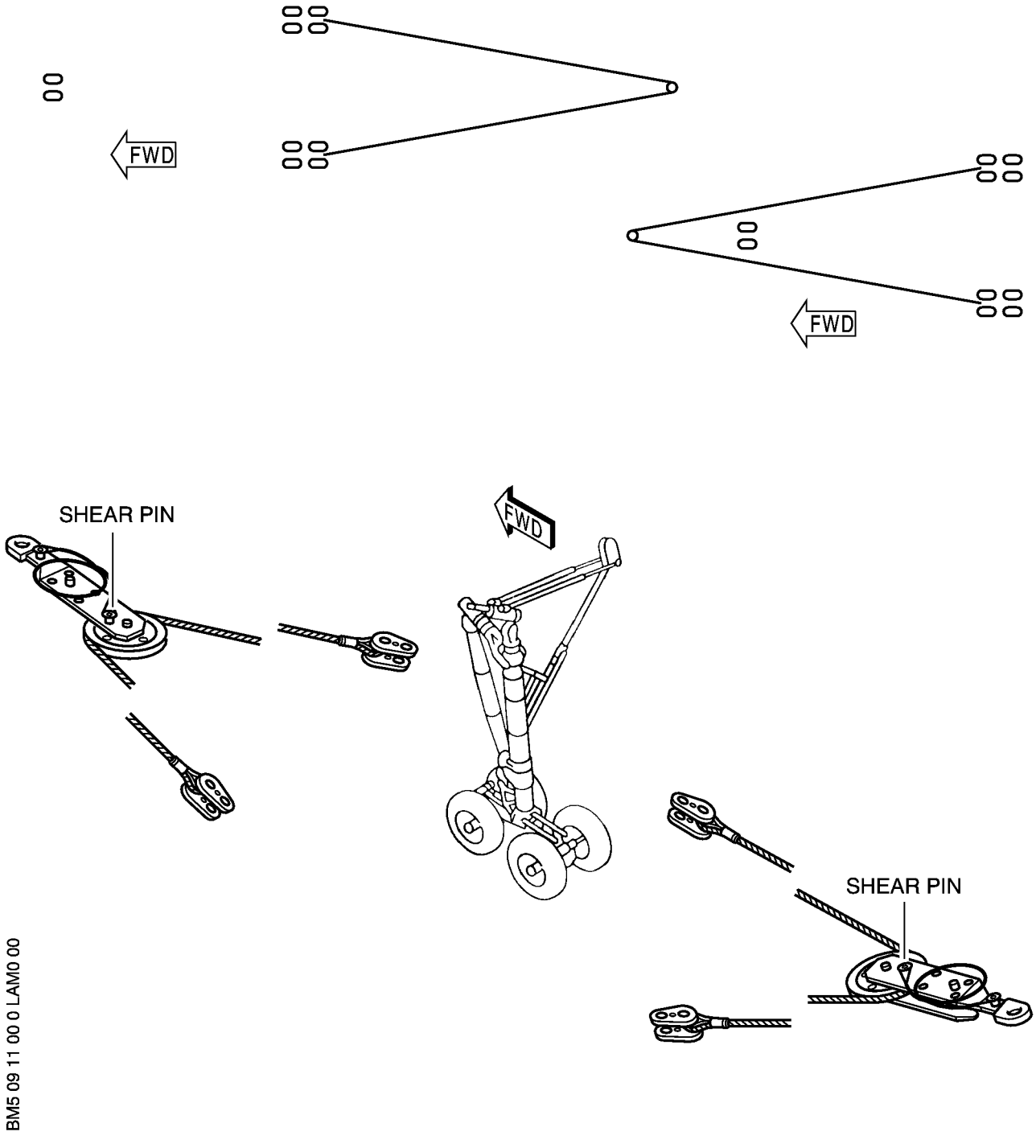
(a)**VHF** system
If communication between the aircraft and the control tower is necessary, the **VHF** communication system **No. 1** must be activated.

R **ON A/C 401-401, 404-500,

(8)Energize the aircraft electrical network.
During towing operations, several aircraft systems have to be electrically supplied.
Before supplying the aircraft electrical network, the Cockpit Safety check must be performed.

(a)Energize the aircraft electrical network (Ref. 24-41-00, P. Block 301).

(b)Or with the **APU**:



Installation of Towing Cable
Figure 028

- energize the aircraft electrical network (Ref. 24-23-00, P. Block 301).

(c)Or with the engine:

- start engine 2 (Ref. 80-00-00, P. Block 201).

(9)Remove the wheel chocks from the main landing gear wheels and nose landing gear wheels.

(10)Lighting System

If necessary, the cockpit **DOME** lights must be switched **ON**.

At night, if the anti-collision lighting is required by local airport regulations or by airline procedures, the **BEACON/STROBE** lighting must be turned **ON**.

(11)Communication systems

(a)VHF system

If communication between the aircraft and the control tower is necessary, the VHF communication system No. 1 must be activated.

**ON A/C ALL

(Ref. Fig. 029)

(Ref. Fig. 015)

(b)Flight interphone system (Ref. Fig. 030)

During the towing operation, the flight interphone system must be used providing communication between the flight compartment and the ground crew.

The ground crew boomset connection is located in the electric ground power receptacle aft of the nose landing gear well.

C. Towing Operation

(1)Approximate Towing Loads

(Ref. Fig. 031, 032)

(a)Apply these coefficients for the friction between the tires and the ground:

Dry concrete or asphalt: 0.80
Wet asphalt: 0.75
Wet concrete: 0.57
Hard snow: 0.20
Ice: 0.05

**ON A/C 226-226, 229-249,

(2)Towing

(Ref. Fig. 031, 032)

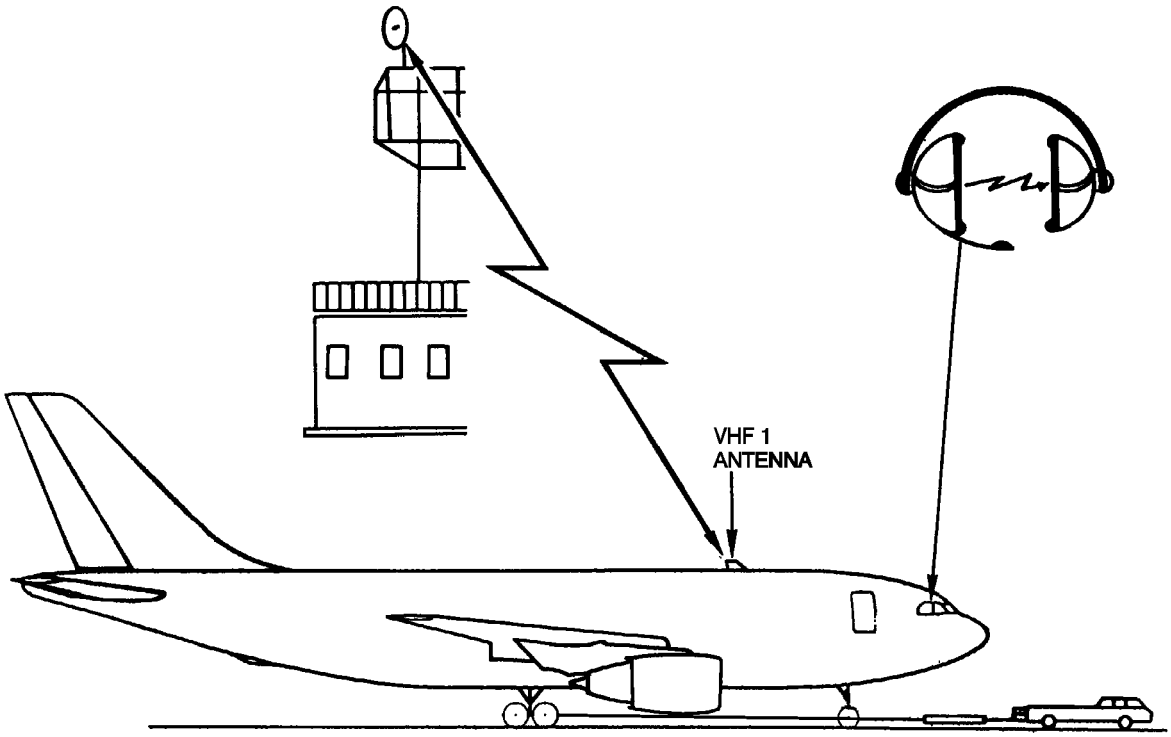
(a)The maximum steering angle in the horizontal plane is 30 degrees on each side of the aircraft centerline.

When the towing is along the aircraft centerline, the nose landing gear keeps the limits.

(b)The maximum angle in the vertical plane is 11 degrees which goes through the towing fitting of the main gear.

(c)During the towing operations, put:

- one person in the cockpit to operate the brake pedals if necessary,
- two persons to monitor the wing tips.



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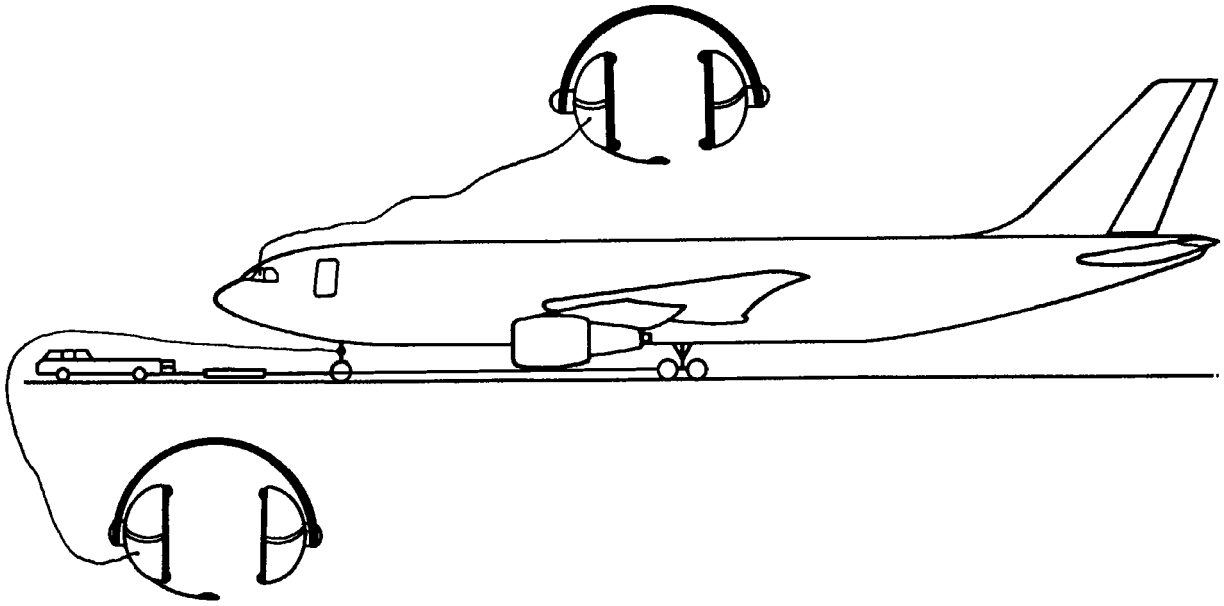
VHF System
Figure 029



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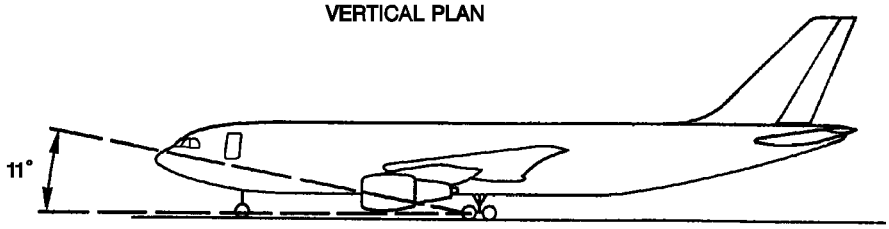
Flight Interphone System
Figure 030

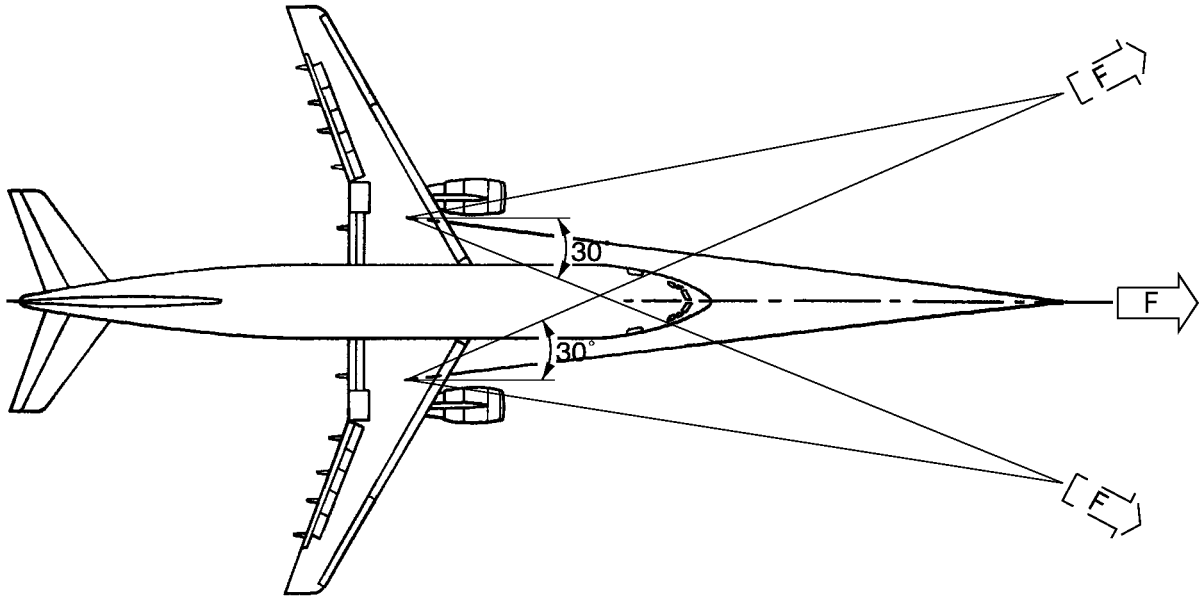
TOWING FORCES F	
BREAKAWAY	6% MTW
ROLLING	3% MTW
BREAKAWAY ON SLOPE	6% MTW +1% MTW PER 1% SLOPE
ROLLING ON SLOPE	3% MTW +1% MTW PER 1% SLOPE

MTW: MAXIMUM TAXI WEIGHT

VERTICAL PLAN



HORIZONTAL PLAN



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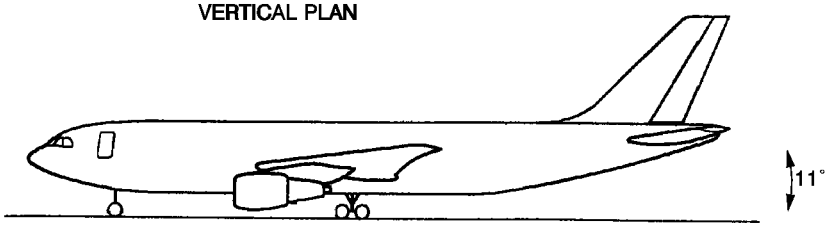
Towing with the Main Landing Gear from the Front
Figure 031

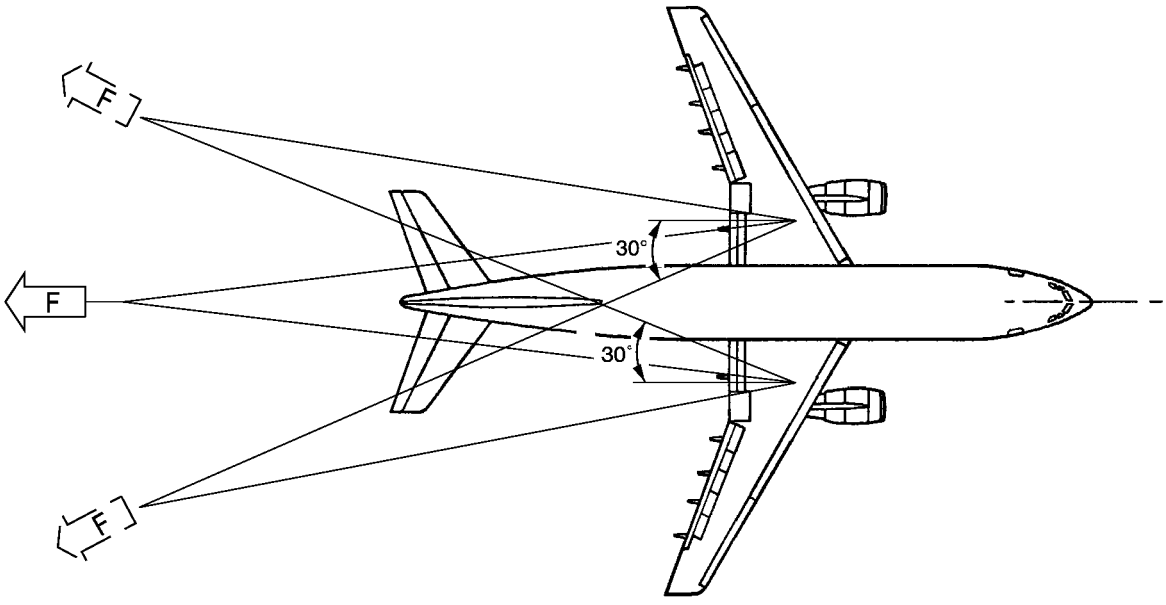
TOWING FORCES F	
BREAKAWAY	6% MTW
ROLLING	3% MTW
BREAKAWAY ON SLOPE	6% MTW +1% MTW PER 1% SLOPE
ROLLING ON SLOPE	3% MTW +1% MTW PER 1% SLOPE

MTW: MAXIMUM TAXI WEIGHT

VERTICAL PLAN



HORIZONTAL PLAN



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Towing with the Main Landing Gear from the Rear
Figure 032

(3)During the towing operations, on the panel 4VU, you must monitor the pressure on the triple pressure indicator on the top gage.
- If the pressure is approximately 2000 psi (137.8951 bar), pressurize the Blue hydraulic system agin (Ref. 29-23-00, P. Block 301).

(4)Tow the aircraft smoothly if possible and keep the tractor aligned with the aircraft centerline. You can make turns only if the ground conditions are good.

4. Close-up

A. Visual Inspection

(1)When you have completed the towing operation, make sure that the nose wheels are aligned with the aircraft centerline.

(2)De-energize the aircraft electrical network.

(a)De-energize the aircraft electrical network (Ref. 24-41-00, P. Block 301).

(b)If you energized with the APU:
- de-energize the aircraft electrical network (Ref. 24-23-00, P. Block 301).

(c)If you energized with the engine:
- stop engine 2 (Ref. 80-00-00, P. Block 301).

(3)Position wheel chocks.

(4)Disconnect the CABLE, TOWING-MLG (98F09103500000) from the forward fittings or the aft fittings of the landing gear and from the tractor.

R **ON A/C 401-401, 404-500,

(2)Towing
(Ref. Fig. 031, 032)

(a)The maximum steering angle in the horizontal plane is 30 degrees on each side of the aircraft centerline.
When the towing is along the aircraft centerline, the nose landing gear keeps the limits.

(b)The maximum angle in the vertical plane is 11 degrees which goes through the towing fitting of the main gear.

(c)During the towing operations, put:
- one person in the cockpit to operate the brake pedals if necessary,
- two persons to monitor the wing tips.

(3)During the towing operations, on the panel 4VU, you must monitor the pressure on the triple pressure indicator on the top gage.
- If the pressure is approximately 2000 psi (137.8951 bar), pressurize the Blue hydraulic system agin (Ref. 29-23-00, P. Block 301).

(4)Tow the aircraft smoothly if possible and keep the tractor aligned with the aircraft centerline. You can make turns only if the ground conditions are good.

4. Close-up

A. Visual Inspection

(1)When you have completed the towing operation, make sure that the nose wheels are aligned with the aircraft centerline.

(2)De-energize the aircraft electrical network.
(a)De-energize the aircraft electrical network (Ref. 24-41-00, P. Block 301).
(b)If you energized with the APU:
- de-energize the aircraft electrical network (Ref. 24-23-00, P. Block 301).
(c)If you energized with the engine:
- stop engine 2 (Ref. 80-00-00, P. Block 201).
(3)Position wheel chocks.
(4)Disconnect the CABLE, TOWING-MLG (98F09103500000) from the forward fittings or the aft fittings of the landing gear and from the tractor.

**ON A/C ALL

(5)Remove the BAR-STEERING, NOSE WHEEL (98A09003000000) from the front fitting of the nose landing gear.
(6)Make sure that the work area is clean and clear of tools and other items.
(7)Apply parking brake.
(8)Remove safety pin and ensure that control lever is in normal position.

R 5. Towing with Tires Deflated
R A. Any one tire deflated on one or more gears (a maximum of three deflated tires).
R Towing by nose gear.
R (1)Both nose gear tires inflated
R Maximum deflection of towbar ± 40°
R (2)One nose gear tire deflated
R Maximum deflection of towbar ± 10°

R B. Two or more tires deflated on the same main gear.
R In such case, the aircraft shall be towed by the main gears and steered by the nose gear using the towbar or normal steering control.
R (1)Three tires deflated on the same gear
R Maximum nose gear steering angle ± 50°
R (2)All four tires deflated on the same main gear
R No deflection whatsoever of the towbar is permitted.

TAXIING

1. Taxiing

R We recommend that the operators refer to their local/airport regulations to
R write their maintenance taxiing procedure.