Scandinavian Airlines System

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CHAPTER 07 – LIFTING AND SHORING

TABLE OF CONTENTS

JACKING AIRPLANE - MAINTENANCE PRACTICES

1. General
   A. This procedure has four tasks:
      (1) Prepare to lift the airplane on jacks.
      (2) Shock strut inflation to increase jack clearance.
         (a) To get ground clearance to remove the engines.
         (b) To get sufficient clearance to install some airplane jacks.
            1) It is possible to use some airplane jacks that do not have sufficient clearance with the airplane jack pad positions.
      (3) Lift the airplane with jacks.
      (4) Lower the airplane off of the jacks.
   B. Three primary jack points are used to lift and lower the airplane.
      (1) These jack points have jack pads which are part of the airplane body (Fig. 201).
   C. Three auxiliary jack points are used to make the airplane stable (when it is necessary) after the airplane is lifted to the necessary height (Fig. 201).
      (1) Jack adapters must be installed at the auxiliary jack points before these jack points can be used.
   D. The airplane can be lifted on jacks in winds up to 30 knots.
      (1) You can do this if the jacks are designed and specified for the 767 airplane.
      (2) If you use jacks that have the same general specifications but are not designed for the 767, you must be careful.
         (a) It is possible that maximum wind speed (30 knots) limits will have to be decreased.

TASK 07-11-01-842-001

2. Prepare to Lift the Airplane on Jacks (Fig. 201, Fig. 202, Fig. 203, Fig. 204)
   A. Equipment
      (1) Airplane Jacks (alternative or equivalent)
         (a) Adapter, Forward Body Jack - A07001-11
         (b) Adapter, Outboard Wing Jack - A07003-1
      (2) Inner Cylinder Retention Strap, MLG and NLG - A32028-6
         Two Retention Straps are necessary for each main landing gear, and one is necessary for the nose landing gear
      (3) Wheel Chocks

B. References
(1) AMM 12-15-01/301, Main Gear Shock Strut
(2) AMM 12-15-02/301, Nose Gear Shock Strut
(3) AMM 32-00-20/201, Landing Gear Downlocks
(4) AMM 32-09-02/201, Air/Ground Relays
(5) AMM 32-32-00/501, Operational Test - Main Landing Gear Extension and Retraction

C. Procedure

S 492-002

(1) Make sure that the landing gear downlocks are installed (AMM 32-00-20/201).

S 042-003

(2) If electrical power is supplied to the airplane while it is on jacks, do the step that follows:

WARNING: DO THE DEACTIVATION PROCEDURE FOR THE FLIGHT MODE SIMULATION (AMM 32-09-02/201) BEFORE YOU LIFT THE AIRPLANE. WHEN YOU DO NOT OBEY THESE INSTRUCTIONS, INJURY TO PERSONS OR DAMAGE TO EQUIPMENT CAN OCCUR.

(a) Do the deactivation procedure for the flight mode simulation (AMM 32-09-02/201).

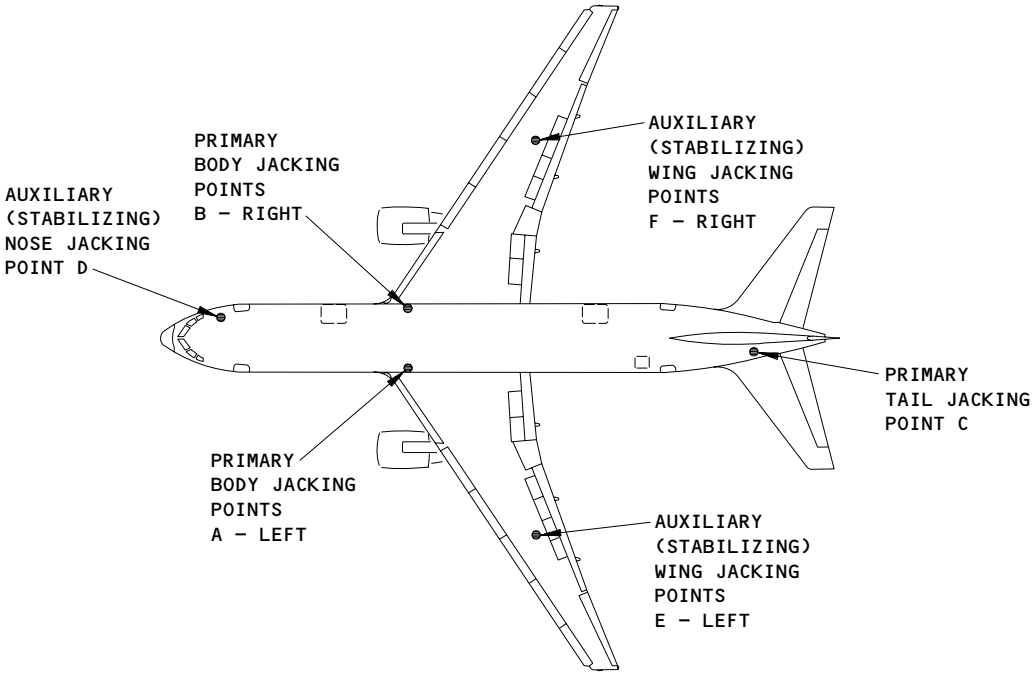
S 792-027

CAUTION: DO NOT CHANGE THE CENTER OF GRAVITY WHEN THE AIRPLANE IS ON THE JACKS. DO NOT TRANSFER FUEL IN THE FUEL TANKS OR PERMIT THE MOVEMENT OF PERSONS AND EQUIPMENT IN OR NEAR THE AFT END OF THE FUSELAGE. ALL NECESSARY PRECAUTIONS MUST BE FOLLOWED OR DAMAGE TO THE AIRPLANE CAN OCCUR.

(3) Make sure that the airplane gross weight and center of gravity (CG) are in the approved limits.

NOTE: The approved limits to lift the airplane on jacks are shown in Figure 203. The procedure to calculate the gross weight and the center of gravity is shown in the airplane's weight and balance manual.

NOTE: It is the airplane operator's decision and responsibility to keep the Center of Gravity (C.G.) within the limits during maintenance and to make sure a minimum number of people are on the wings when the airplane is on jacks.



JACKING POINT		MAX JACK LOAD X 1,000 LB (kg) 2	LOCATION			JACKING POINT HEIGHT 767-200/767-300 1		ADAPTER FITTING
			B STA	BBL	WL	MINIMUM HEIGHT, INCHES (cm)	EXTENDED HEIGHT, INCHES (cm) 3	
PRIMARY 4	A	150.0 (68)	784.5	97.4L	136.8	98.5 (250) 5 6	139.8 (355) 161.8 (411) 8	NONE
	B	150.0 (68)	784.5	97.4R	136.8	98.5 (250) 5 6	139.8 (355) 161.8 (411) 8	NONE
	C	67.0 (30.4)	1725.3	35.9L	181.4	148.6 (377) 5 7	184.3 (468) 206.3 (524) 8	NONE
AUXILIARY	D	28.0 (12.7)	287.0	73.0R	145.5	105.0 (266)	149.4 (379) 9	YES
	E	21.0 (9.5)	1157.0	530.5L	202.0	165.2 (420)	205.7 (522) 9	YES
	F	21.0 (9.5)	1157.0	530.5R	202.0	165.2 (420)	205.7 (522) 9	YES
AXLE	MAIN GEAR	105.0 (47.6) 10	WHEEL AXLES 4 TOTAL			6.5 (16.5) 11	17.5 (44) 13	NONE
						11.9 (30.2) 12	17.5 (44) 13	
	NOSE GEAR	50.0 (22.7) 10	WHEEL AXLES 1 TOTAL			7.1 (18.0) 11	17.3 (43.9) 13	NONE
						12.5 (31.7) 12	17.3 (43.9) 13	

Airplane Jacking System Specifications
Figure 201 (Sheet 1)

1 JACKING POINTS A, B, D, E AND F HEIGHTS WILL VARY LESS THAN 0.1 INCH (0.254 cm) FROM THE VALUES FOR THE 767-200. JACKING POINT C WILL BE APPROXIMATELY 0.7 INCH (1.78 cm) LOWER DUE TO ADDITIONAL AFT FUSELAGE DEFLECTION.

2 INCLUDES 35 KNOT (65 km/hr) WIND LOAD

3 EXTENDED JACK HEIGHT BASED ON:
1. AIRPLANE LEVEL
2. STRUT OLEOS EXTENDED/SHOCK STRUTS FULLY EXTENDED
3. GROUND CLEARANCES
   a. GEAR DOWN AND LOCKED 6 INCHES (15.2 cm)
   b. DURING GEAR SWING/RETRACTION 3.6 INCHES (9.1 cm)

4 FOR MAXIMUM JACKING WEIGHT: SEE FIGURE 203

5 JACKING POINT HEIGHT FOR JACKS BASED ON:
1. AIRPLANE WEIGHT 185,500 POUNDS (84143 kg)
2. CG RANGE: SEE FIGURE 203
3. STRUT OLEOS DEFLATED/SHOCK STRUTS FULLY COMPRESSED
4. MAIN TIRES 45 X 17-20
   NOSE TIRES 37 X 14-15
5. NORMAL TIRE INFLATION
6. 2 INCHES (5 cm) ROLL-UNDER CLEARANCE

6 ROLL-UNDER HEIGHT IS REDUCED 4.3 INCHES (11 cm) WITH MAIN TIRES FLAT

7 ROLL-UNDER HEIGHT IS REDUCED 12.2 INCHES (31 cm) WITH MAIN TIRES FLAT

8 MINIMUM REQUIRED JACK HEIGHT TO INSTALL MAIN LANDING GEAR SEALS

9 AN ADDITIONAL 26 INCHES (66 cm) IS REQUIRED TO REMOVE MLG OLEO INNER CYLINDER FROM STRUT

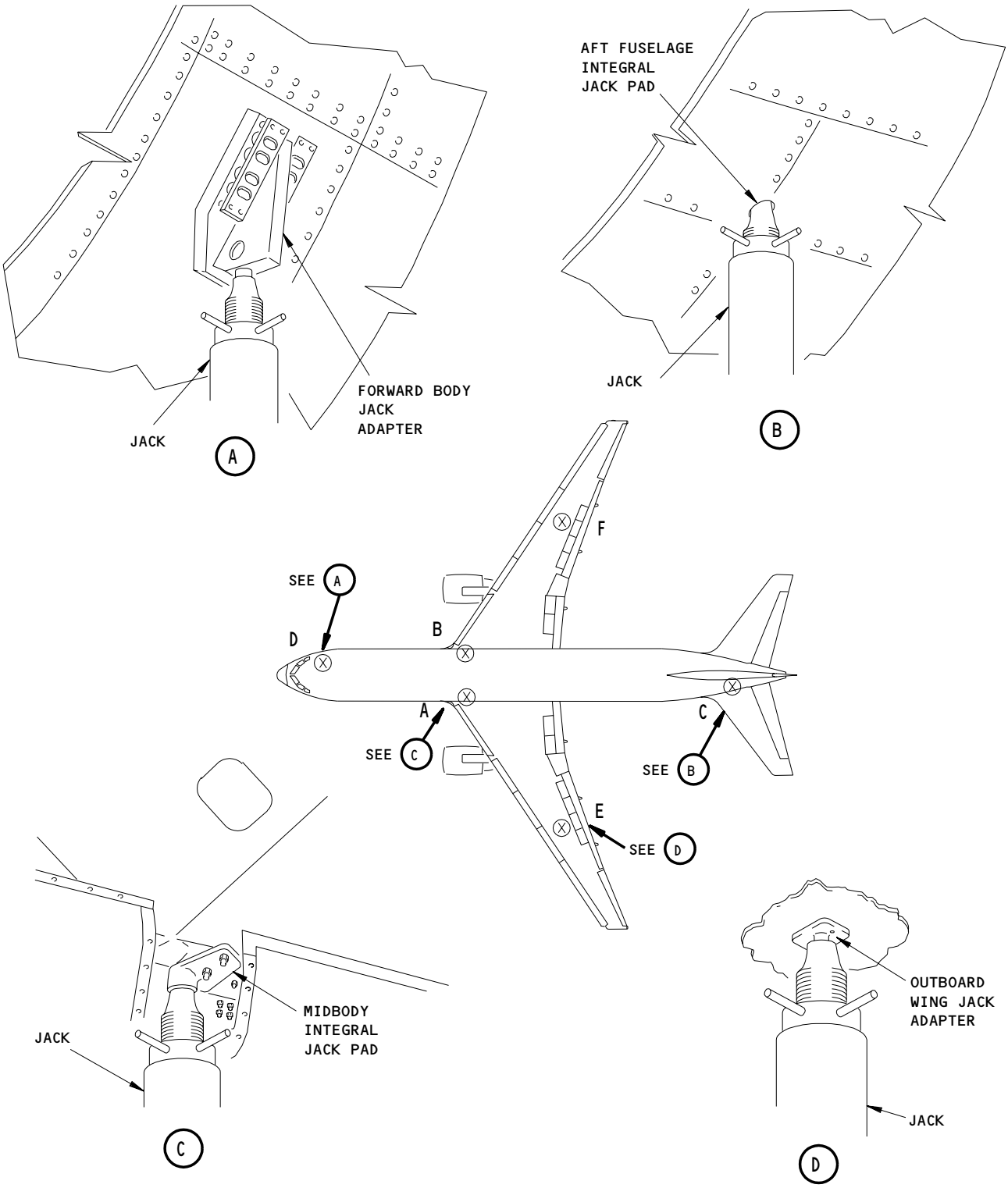
10 MAXIMUM AXLE JACKING WEIGHT IS EQUAL TO THE MAXIMUM TAXI WEIGHT OF THE AIRPLANE

11 FLAT TIRES AT MAXIMUM TAXI WEIGHT

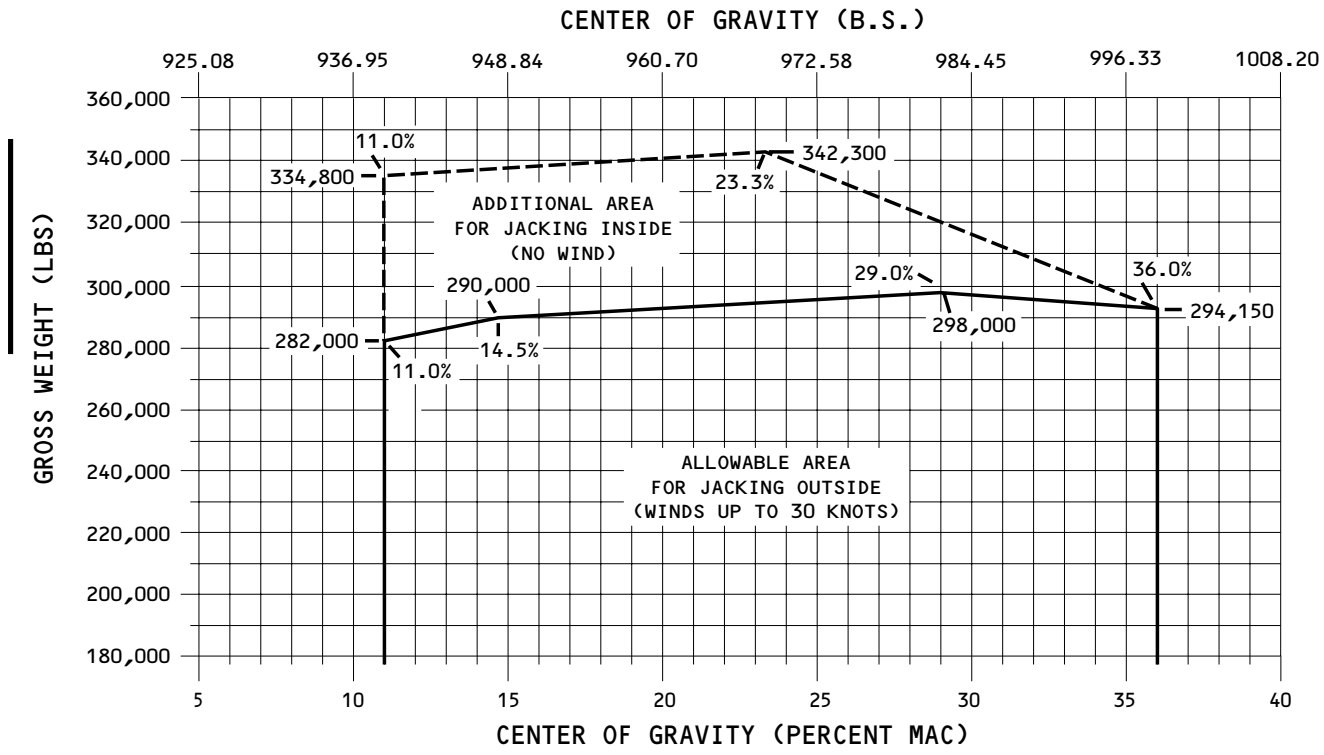
12 NORMAL TIRE INFLATION AT MAXIMUM TAXI WEIGHT

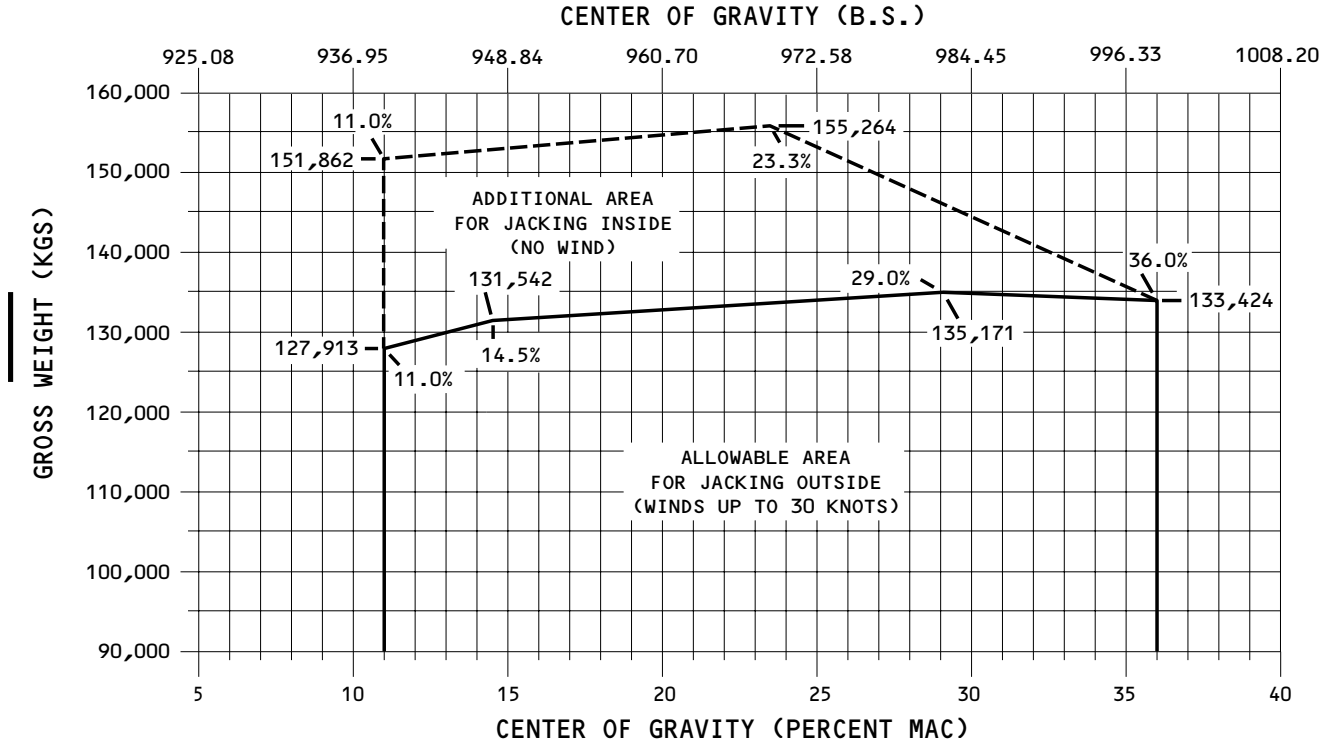
13 EXTENDED HEIGHT ALLOWS 2 INCHES (5 cm) GROUND CLEARANCE

Airplane Jacking System Specifications
Figure 201 (Sheet 2)



Airplane Jacking Points and Jack Adapters
Figure 202





NOTE: DURING THE AIRPLANE RAISING AND LOWERING OPERATION, THE AIRPLANE MUST BE WITHIN THE WEIGHT AND BALANCE LIMITS AS SHOWN.

Airplane Jacking Weight and Center of Gravity Limits
For Jacking at Primary Jack Points
Figure 203 (Sheet 1)

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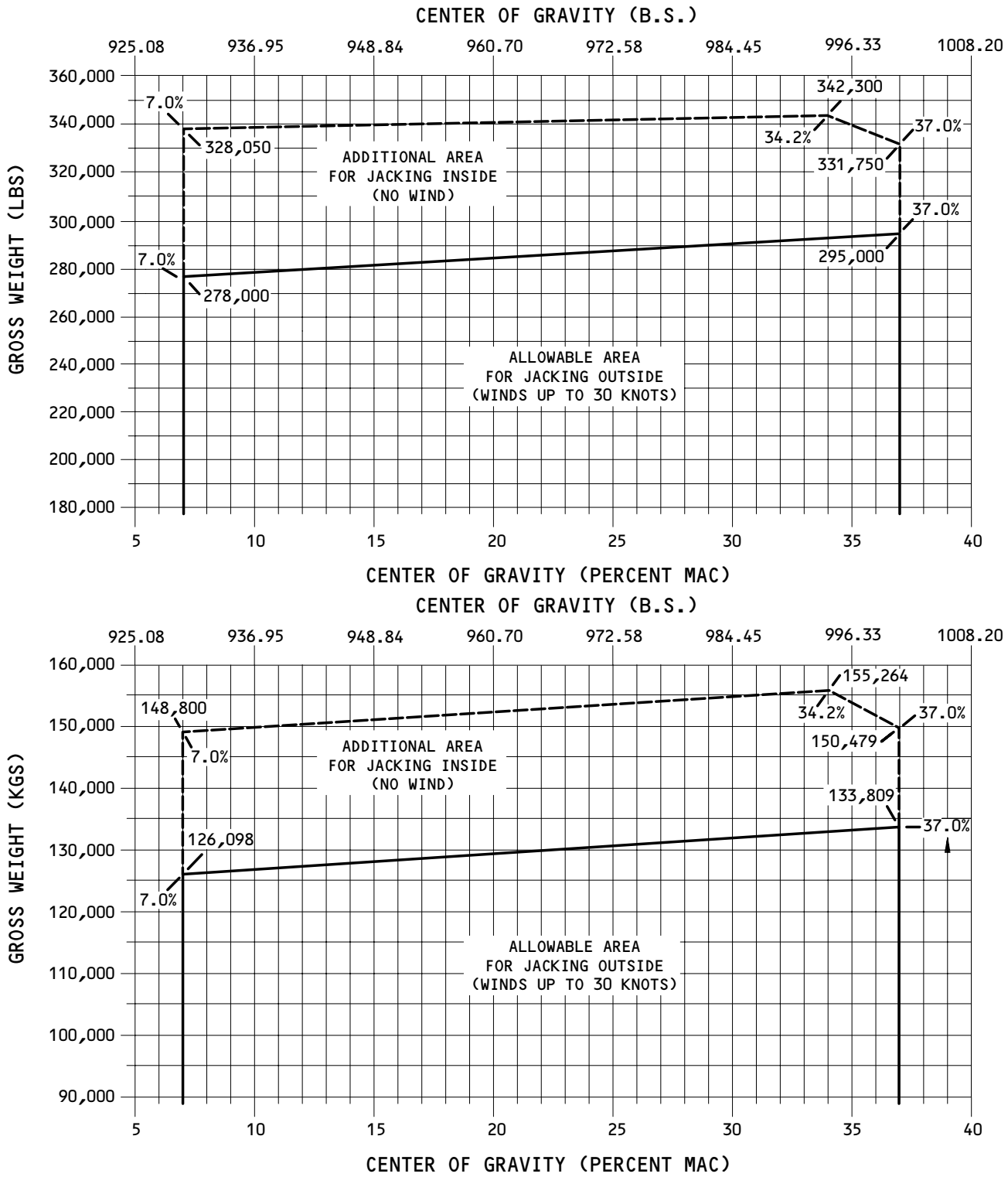

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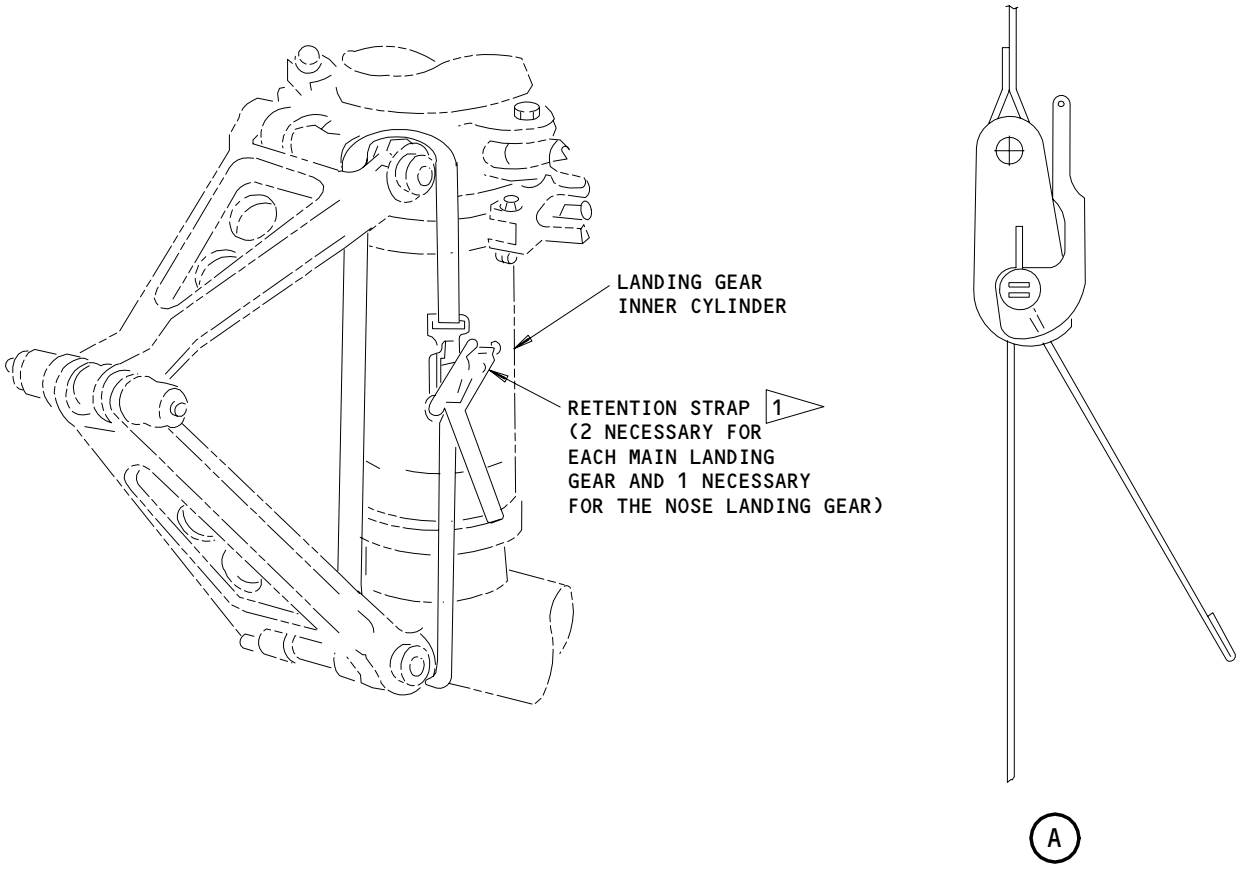
Airplane Jacking Weight and Center of Gravity Limits
For Jacking at Primary Jack Points
Figure 203 (Sheet 2)



1 BEFORE YOU APPLY A LOAD, INSERT THE STRAP THROUGH THE SLOT AND WRAP TWO LOOPS OF WEBBING AROUND THE SHAFT OF THE BUCKLE

Shock Strut Inner Cylinder Retention Strap Use
Figure 204

S 212-032

(4) Examine the following areas of the nose jacking, body jacking, wing jacking, and tail jacking points.
   (a) The examination should look for obvious signs of distress such as:
      1) Local buckling of surrounding structure,
      2) Cracked paint,
      3) Pulled or distorted fastener heads, or local yielding of material.

S 582-023

CAUTION: DO NOT LIFT THE AIRPLANE ON JACKS IN WINDS MORE THAN 30 KNOTS. IF YOU DO NOT OBEY THESE INSTRUCTIONS, DAMAGE TO THE AIRPLANE CAN OCCUR.

(5) Make sure the airplane is turned into the wind if it is possible, when it is out of the hangar.

NOTE: If you use jacks that have the general specifications but are not designed for the 767, be careful. It is possible that the maximum wind speed (30 knots) limits will have to be decreased.

S 612-006

CAUTION: DO NOT DEFLATE THE SHOCK STRUTS IF YOU DO A GEAR RETRACTION TEST. THE SHOCK STRUTS MUST BE FILLED CORRECTLY AND NOT INFLATED ABOVE THE CORRECT PRESSURE. DAMAGE TO THE WHEEL WELL AND SHOCK STRUT WILL OCCUR.

(6) If you lift the airplane on jacks for a gear retraction test, use the primary body jacking points (Fig 201), and do the steps that follow:

NOTE: Airplane jacks that use a minimum clearance (as given in the Shock Strut Inflation to Increase Jack Clearance procedure) are not recommended when a gear retraction test is necessary. Added servicing steps must be done before the gear retraction test.

   (a) Make sure that the nose landing gear shock strut is filled to the correct pressure before a gear retraction test (AMM 12-15-02/301).
   (b) Make sure that the main landing gear shock struts are filled to the correct pressure before a gear retraction test (AMM 12-15-01/301).

S 042-040

CAUTION: MAKE SURE THE AREA BELOW THE AIRPLANE IS CLEAR OF ALL EQUIPMENT BEFORE THE SHOCK STRUTS ARE DEFLATED. IF YOU DO NOT OBEY THESE INSTRUCTIONS, DAMAGE TO THE AIRPLANE CAN OCCUR.

(7) Prior to jacking the airplane, turn the TCAS mode selector switch to STBY (standby) to prevent the possibility of transmitting data to nearby aircraft while on jacks (Ref 34/45/00).

S 862-042

(8) When you lift the airplane on jacks for leveling, weighing, or general maintenance (not a gear retraction test), do the steps that follow.

NOTE: If jacks with insufficient clearance are being used, do the task below titled Shock Strut Inflation to Increase Jack Clearance.

(a) Deflate the shock struts of the nose landing gear (AMM 12-15-02/301).

(b) Deflate the shock struts of the main landing gear (AMM 12-15-01/301).

CAUTION: DO NOT USE THE INNER CYLINDER RETENTION STRAPS ON INFLATED SHOCK STRUTS. THE RETENTION STRAPS HAVE A LOAD LIMIT.

(c) Install the retention straps for the shock struts as shown in Figure 204.

NOTE: When you deflate the shock struts and install the retention straps, the height that the airplane has to be lifted is decreased.

(d) Remove the air valve cap.

WARNING: DO NOT REMOVE THE AIR VALVE BODY ON A SHOCK STRUT WHEN IT IS PRESSURIZED. LOOSEN THE AIR VALVE NUT, TWO TURNS MAXIMUM. IF YOU LOOSEN THE AIR VALVE BODY MORE THAN TWO TURNS, THE PRESSURE CAN CAUSE THE VALVE TO BLOW OUT. INJURY TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(e) Loosen the air valve nut, two turns. Let the shock strut deflate fully.

NOTE: Put a flexible hose on the air valve and put the other end in a container. This will catch the hydraulic fluid that comes out.

(f) After the shock strut is fully deflated, open the air valve fully.

S 492-008

(9) Place wheel chocks approximately 2-4 inches away from all landing gear wheels . This will prevent forward and aft movement of the airplane before the jacks are set.

S 492-009

(10) Install the jack adapters as shown in Figure 202, if the auxiliary jacks will be used.
(a) Remove the filler bolts (8) from the jack pad at the forward body jack point. Keep the bolts so they can be installed after the jack is removed.

S 422-037

(11) Ground airplane to approved grounding attach point when aircraft is on jacks (AMM 20-41-00/202).

S 092-010

(12) Make sure the area is clear of persons, work platforms, entry stands, and other support equipment that are not necessary.

TASK 07-11-01-612-011

3. Shock Strut Inflation to Increase Jack Clearance

A. General

(1) It is possible to use some airplane jacks (such as 747 jacks) that do not have sufficient clearance with the airplane jack pad position. The subsequent special shock strut inflation procedure can be used to increase the jack clearance (Fig. 201).

NOTE: Measure the difference between the shock strut "A" dimension and the maximum permitted "A" dimension. When you use this procedure, you can find the approximate jack clearance that you get when you inflate the shock strut. Refer to AMM 12-15-01/301 for the main landing gear and AMM 12-15-02/301 for the nose landing gear dimension "A" definitions.

B. Consumable Materials

(1) Shock Strut Servicing Fluid

C. References

(1) AMM 12-15-01/301, Main Gear Shock Strut
(2) AMM 12-15-02/301, Nose Gear Shock Strut

D. Procedure

S 862-012

(1) Deflate the shock struts of the main landing gear (AMM 12-15-01/301).

S 862-013

(2) Deflate the shock struts of the nose landing gear (AMM 12-15-02/301).

S 612-030

WARNING: MAKE SURE THAT PERSONS AND EQUIPMENT ARE CLEAR OF THE MAIN LANDING GEAR TRUCKS. DO THIS WHEN YOU PRESSURIZE THE CENTER HYDRAULIC SYSTEM WITH THE AIRPLANE LIFTED ON THE PRIMARY JACKS. HYDRAULIC PRESSURE WILL TILT THE TRUCKS AND THE FAST MOVEMENT CAN CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

(3) Inflate the shock struts of the main landing gear and nose landing gear with servicing fluid. Do the steps that follow:
(a) Close the air-charge valve of the shock strut
(b) Attach the oil charge line to the oil-charge valve of the shock strut and open the valve.

WARNING: DO NOT INFLATE THE SHOCK STRUTS TO MORE THAN 2000 PSI. IF THE SHOCK STRUTS ARE INFLATED TO MORE THAN 2000 PSI, INJURY TO PERSONS CAN OCCUR. DAMAGE TO EQUIPMENT CAN ALSO OCCUR.

CAUTION: DO NOT INFLATE THE NOSE GEAR SHOCK STRUTS TO AN "A" DIMENSION MORE THAN 18 INCHES. IF THE "A" DIMENSION IS MORE THAN 18 INCHES, DAMAGE TO THE SEALS CAN OCCUR.

CAUTION: DO NOT INFLATE THE MAIN GEAR SHOCK STRUTS TO AN "A" DIMENSION MORE THAN 25 INCHES. IF THE "A" DIMENSION IS MORE THAN 25 INCHES, DAMAGE TO THE SEALS CAN OCCUR.

(c) Put the correct servicing fluid into the shock strut with a pump. Do this until the shock strut has extended sufficiently for the jacks to be moved into position.

NOTE: Refer to AMM 12-15-01/301 for the main landing gear and AMM 12-15-02/301 for the nose landing gear "A" dimension definitions.

(d) Close the oil-charge valve of the shock strut.

TASK 07-11-01-582-015

4. Lift the Airplane with Jacks

A. Reference

(1) AMM 08-21-00/201, Leveling

(2) AMM 29-11-00/201, Main (Left, Right and Center) Hydraulic Systems

(3) AMM 32-32-00/501, Operational Test - Main Landing Gear Extension and Retraction

B. Procedure:

S 582-016

(1) Do the steps that follow to lift the airplane on jacks (Fig. 201):

(a) Put one person at each jack and one person at the plumb bob. Do not use the inclinometers in the wheel well for jacking. Make sure there is interphone communication between them and the coordinator for the jack procedures.

(b) Put the primary jacks directly below the jack pads at points A, B, and C as shown in Figure 202.

(c) Rotate the jack to align the castors to follow each other and center the jack.

(d) Put the auxiliary jacks close to (not below) the airplane at jack points D, E, and F as shown in Figure 202. Install the auxiliary jacks after you get the necessary airplane height with the primary jacks.

NOTE: It is the airline's decision if the auxiliary jacks are necessary when the airplane is in the hangar (no wind). It is also their decision if the CG is kept in limits during maintenance, and the minimum number of persons are on the wings.

(e) Make sure the jacks are level.

(f) Operate the main jacks with hand pump or air pressure to push jack post up to the jack pads and seat jack on floor. Refer to the jack manufacturers' instructions.

(g) Remove the wheel chocks.

CAUTION: THE PARKING BRAKE MUST REMAIN RELEASED WHILE LIFTING THE AIRPLANE WITH JACKS. FAILURE TO RELEASE THE BRAKE CAN RESULT IN DAMAGE TO THE AIRPLANE AND EQUIPMENT.

(h) Release the parking brake.

(i) Lift the airplane with the jacks. Continuously monitor the jacks using ton reading and make sure that the maximum jack point loads are not more than the design limits. Also, monitor the plumb bob to make sure the airplane stays level while it is lifted on jacks.
NOTE: The parameters to keep the airplane level when you jack are +/- 3 degrees of roll and +/- 0.5 degrees of pitch.

(j) When you lift the airplane, always lower all the jack ram locknuts at the same time you lift the jacks. Keep a clearance of one inch (2.5 centimeters) or less from the nut to the collar until you complete the jacking.
1) If a landing gear retraction is going to be done:
a) Pressurize the center hydraulic sytem (AMM 29-11-00/201).

NOTE: Make sure the pressurized center hydraulic system moves the main landing gear to full forward tilt.

b) Make sure, with the landing gear down and locked, the clearance between the lowest main landing gear tire and the ground is a minimum of 6 inches (15.24 cm).

NOTE: If you do a landing gear retraction, a minimum tire clearance of 6.0 inches (15.24 cm) is recommended between the front main landing gear tires and the ground. During retract/stowed position truck operation, with the truck at full forward tilt, the minimum clearance between the lowest main landing gear tire and the ground will be 3.6 inches (9.1 cm).

(k) If it is necessary, put the auxiliary jacks directly below the jack adapters at points D, E, and F. Use the manufacturer's instructions and lift the jacks until you get the specified loads. The loads are 20,000 lbs on the jack at point D, and 12,000 lbs on the jacks at points E and F.
(l) If non 767 airplane jacks were used (such as the 747 jacks) and subsequently the above special shock strut inflation procedure was followed, service the shock struts per AMM 12-15-01 prior to a main landing gear extention and retraction operational test.
(m) Main landing gear extension and retraction operational test, AMM 32-32-00/501.

TASK 07-11-01-582-017
5. Lower the Airplane Off of the Jacks
A. References
(1) AMM 12-15-01/301, Main Gear Shock Strut

(2) AMM 12-15-02/301, Nose Gear Shock Strut
(3) AMM 32-00-20/201, Landing Gear Downlocks

B. Procedure

S 582-018

(1) Lower the airplane off of the jacks (Fig. 201). Do the steps that follow:

CAUTION: MAKE SURE THE AREA BELOW THE AIRPLANE IS CLEAR OF ALL EQUIPMENT BEFORE THE AIRPLANE IS LOWERED. IF YOU DO NOT OBEY THESE INSTRUCTIONS, DAMAGE TO THE AIRPLANE CAN OCCUR.

(a) Make sure the area below the airplane is clear.
(b) Make sure the landing gear control lever is in the DN position.
(c) Make sure the landing gear downlocks are installed on the nose and main landing gear (AMM 32-00-20/201).
(d) Deflate the landing gear shock struts, if they are inflated.

NOTE: If the Shock Strut Inflation to Increase Jack Clearance procedure was used, do not deflate the shock strut. You can deflate the shock struts after all of the jacks are removed.

(e) If the auxiliary jacks were used at jack points D, E, and F, lower the jacks. Refer to the manufacturers' instructions.
1) Remove the jacks from below the airplane immediately after the jacks clear the jack adapters and adjacent airplane structure.
(f) Put the wheel chocks in position to be installed when the airplane is on the ground. Make sure the wheel chocks do not touch the wheels while the airplane is lowered. Once the airplane is on the ground, place wheel chocks approximately 2-4 inches away from the wheels.
(g) Put one person at each primary jack and one person at the plumb bob. Make sure there is interphone communication between them and the coordinator for the jack procedures.
(h) Lower the airplane. Continuously monitor the jacks and make sure that the maximum loads are not more than the design load limits. Also monitor the plumb bob to make sure the airplane stays level while it is lowered off of the jacks.

NOTE: Make sure the jacks are at the bottom or the airplane full weight is on the landing gear.

(i) Remove the primary jacks from jack points A, B, and C. Remove them from under the airplane immediately after the jacks have cleared the jack pad and the adjacent airplane structure.

C. Put the Airplane Back to Its Initial Condition

S 092-019

(1) Remove the jack adapters (when the auxiliary jacks were used).
   (a) Install the filler bolts (8) at jack point D, on the fuselage.

S 612-020

(2) Do the servicing of the shock struts on the main landing gear (AMM 12-15-01/301).

NOTE: When the Shock Strut Inflation to Increase the Jack Clearance procedures are used, deflate the shock strut and do the correct servicing.

S 612-021

(3) Do the servicing of the shock strut on the nose landing gear (AMM 12-15-02/301).

NOTE: When the Shock Strut Inflation to Increase the Jack Clearance procedures are used, deflate the shock strut and do the correct servicing.

S 042-024

(4) If electrical power was supplied during jacking do the steps that follow:
   (a) On the PSEU (in the main equipment center, E-1 rack), push the RESET switch to erase the PSEU memory.

   NOTE: Code "EEE" will be shown on the PSEU display during the erase procedure.

   (b) Do the activation procedure for the flight mode simulation if you did the deactivation procedure (AMM 32-09-02/201).

JACKING AIRPLANE NOSE - MAINTENANCE PRACTICES

TASK 07-11-02-582-001

1. Lift the Airplane Nose on Jacks

A. General

(1) This section gives instructions to lift the airplane nose on jacks. One jack point can be used to lift or lower the nose when the correct precautions are used. Also, the nose is lifted when the airplane is lifted fully, on jacks. A jack adapter must be installed at jack point D before the airplane nose is lifted.

(2) You can lift the airplane nose with jacks in winds up to 35 knots.

(3) To lift the airplane nose at jack point D, use one of these methods:

(a) You can lift the nose independently at jack point D after the nose strut has been extended, or the nose can be lifted at jack point D when the nose strut is deflated, and the retention strap is installed.

B. Equipment

(1) Airplane Jack (AMM 07-11-01)

(2) Jack (alternative or equivalent)

(a) Adapter, Forward Body Jack- A07001-11

(3) Inner Cylinder Retention Strap, NLG - A32028-6

(4) Wheel chocks

C. References

(1) AMM 07-11-01/201, Jacking Airplanes

(2) AMM 07-11-03/201, Jacking Airplane Axles

(3) AMM 12-15-02/301, Nose Gear Shock Strut

(4) AMM 32-00-20/201, Landing Gear Downlocks

(5) AMM 32-09-02/201, Air/Ground Relay System

(6) AMM 32-51-00/001, Nose Wheel Steering System

D. Access

(1) Location Zones

116 Area Between Nose Gear Wheel Well and Fuselage, Right (Nose Jack Point)

711 Nose Landing Gear

E. Prepare to Lift the Airplane Nose on Jacks

S 492-002

(1) Make sure that the landing gear downlocks are installed (AMM 32-00-20/201).

S 042-021

(2) If electrical power is supplied to the airplane while it is on jacks, do the steps that follow:

WARNING: DO THE DEACTIVATION PROCEDURE FOR THE FLIGHT MODE SIMULATION (AMM 32-09-02/201) BEFORE YOU LIFT THE AIRPLANE. WHEN YOU DO NOT OBEY THESE INSTRUCTIONS, INJURY TO PERSONS OR DAMAGE TO EQUIPMENT CAN OCCUR.

(a) Do the deactivation procedure for the flight mode simulation (AMM 32-09-02/201).

S 972-003

(3) Make sure that the airplane gross weight and center of gravity (CG) are at approved limits. The approved limits to lift at the forward body jack point are shown in Fig. 202.

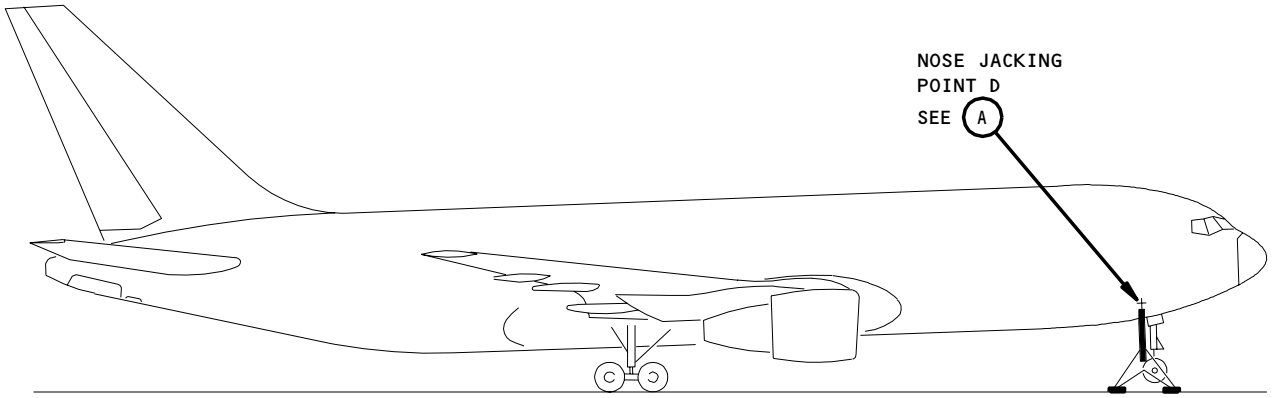
S 582-019

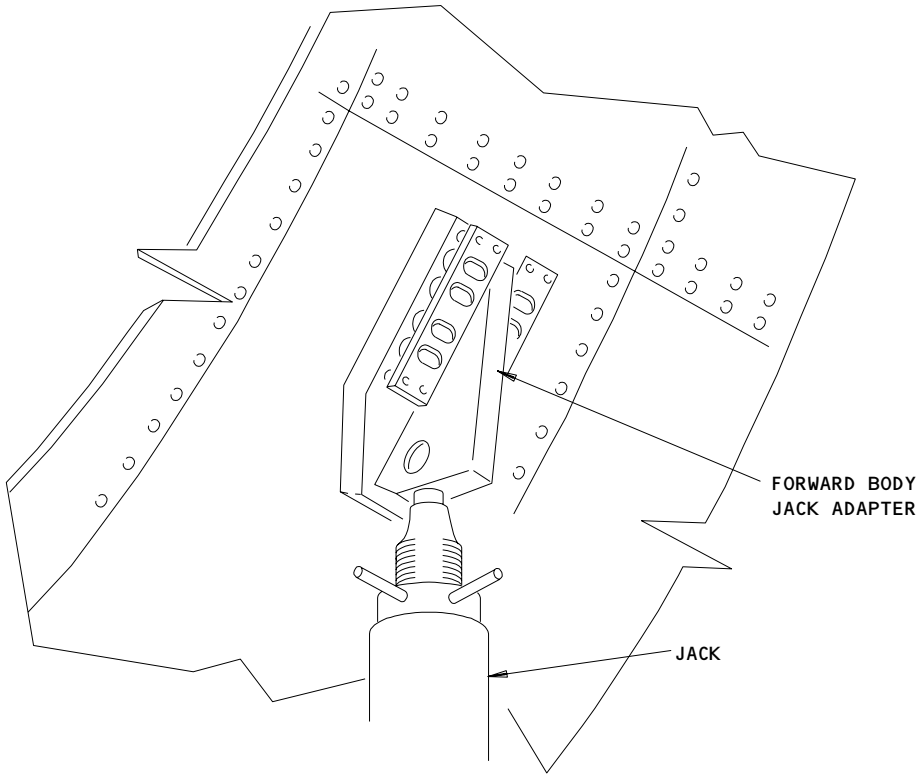
CAUTION: DO NOT LIFT THE AIRPLANE ON JACKS IN WINDS MORE THAN 35 KNOTS. IF YOU DO NOT OBEY THESE INSTRUCTIONS, DAMAGE TO THE AIRPLANE CAN OCCUR.

(4) Make sure the airplane is turned into the wind if it is possible, when it is out of the hangar.

S 212-026

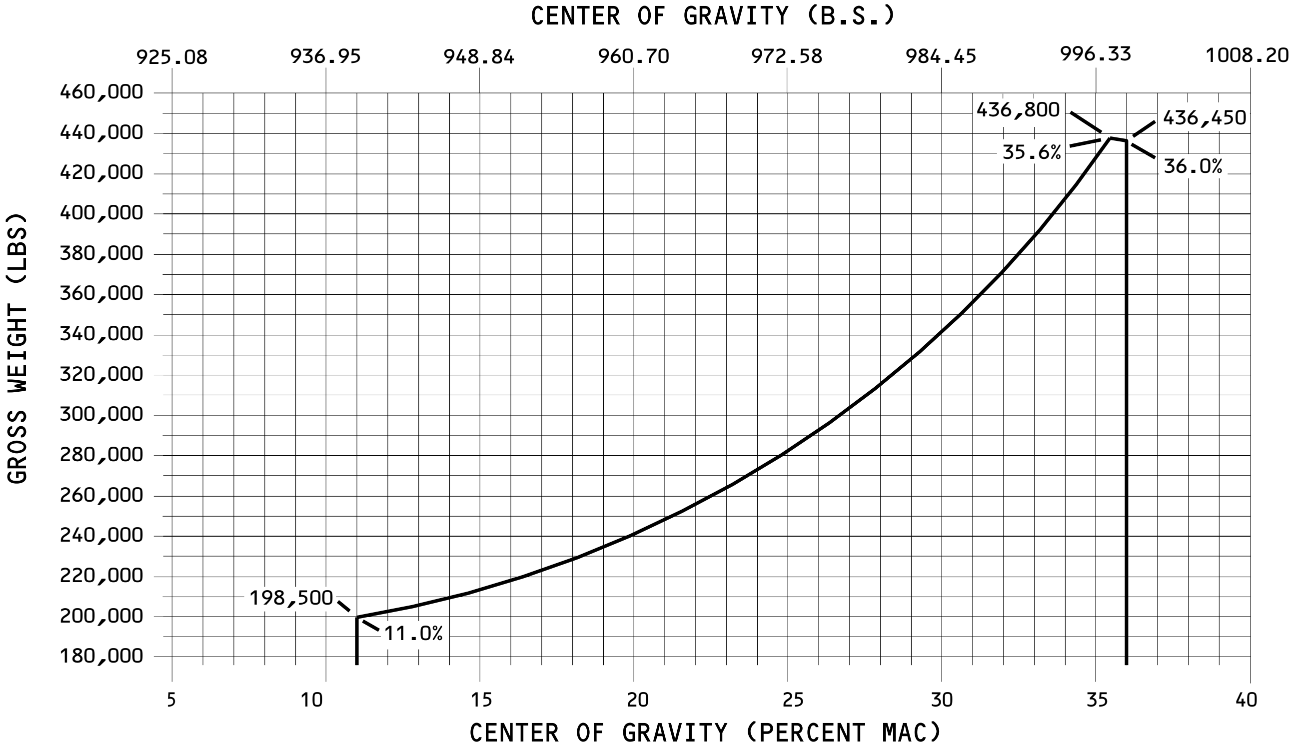
(5) To change a wheel or a tire, you can lift the nose landing gear with a nose axle jack (AMM 07-11-03/201).

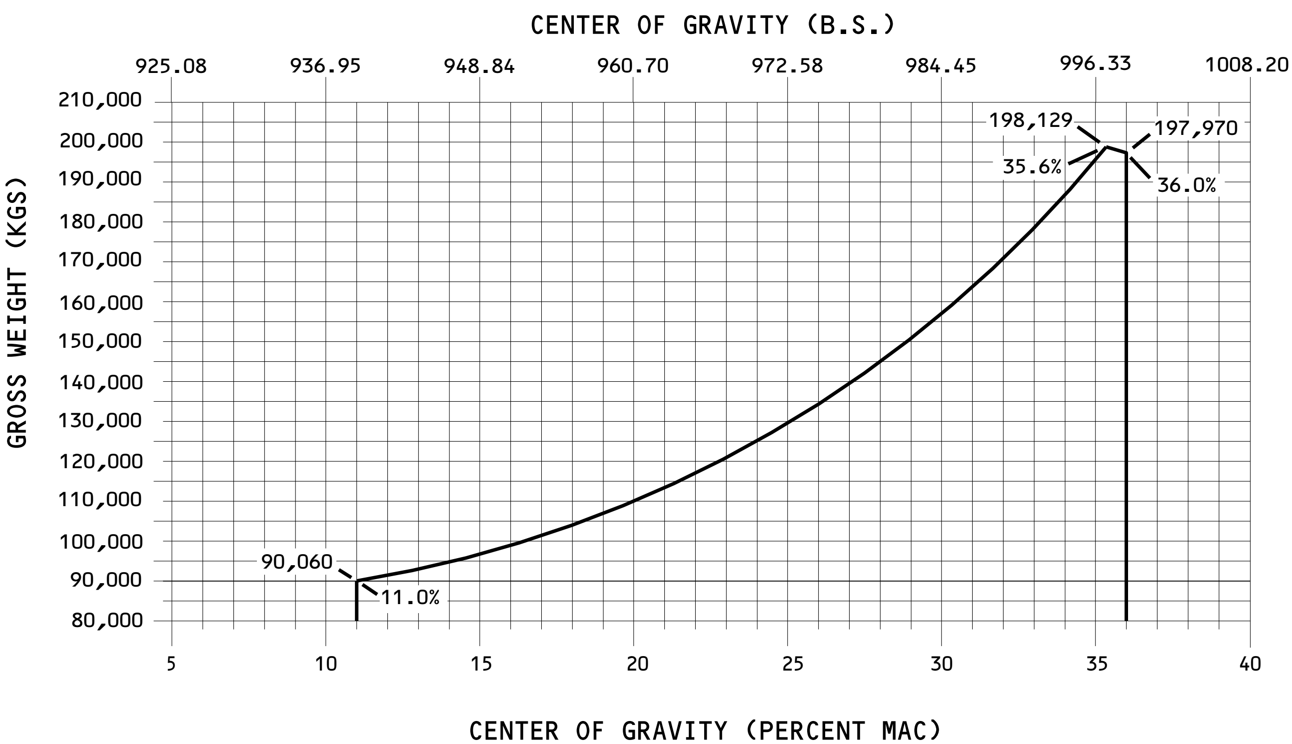




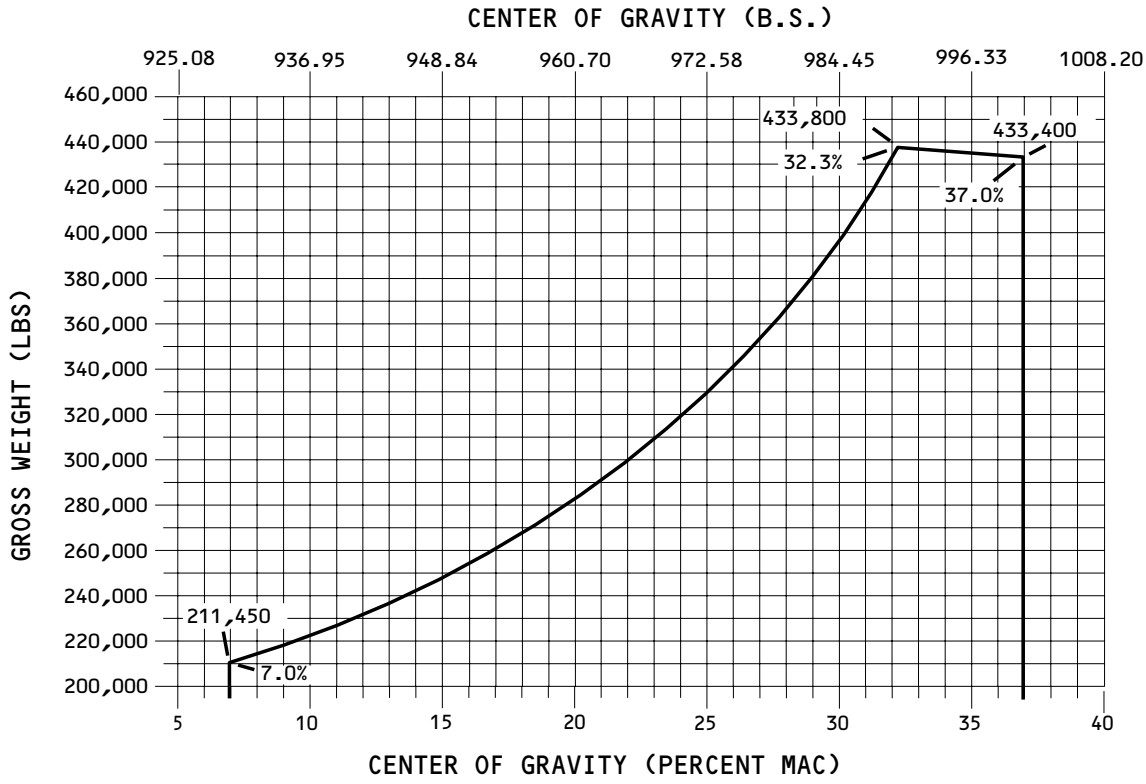
NOTE: 767-400 RAKED WINGTIPS ARE NOT SHOWN. (A)

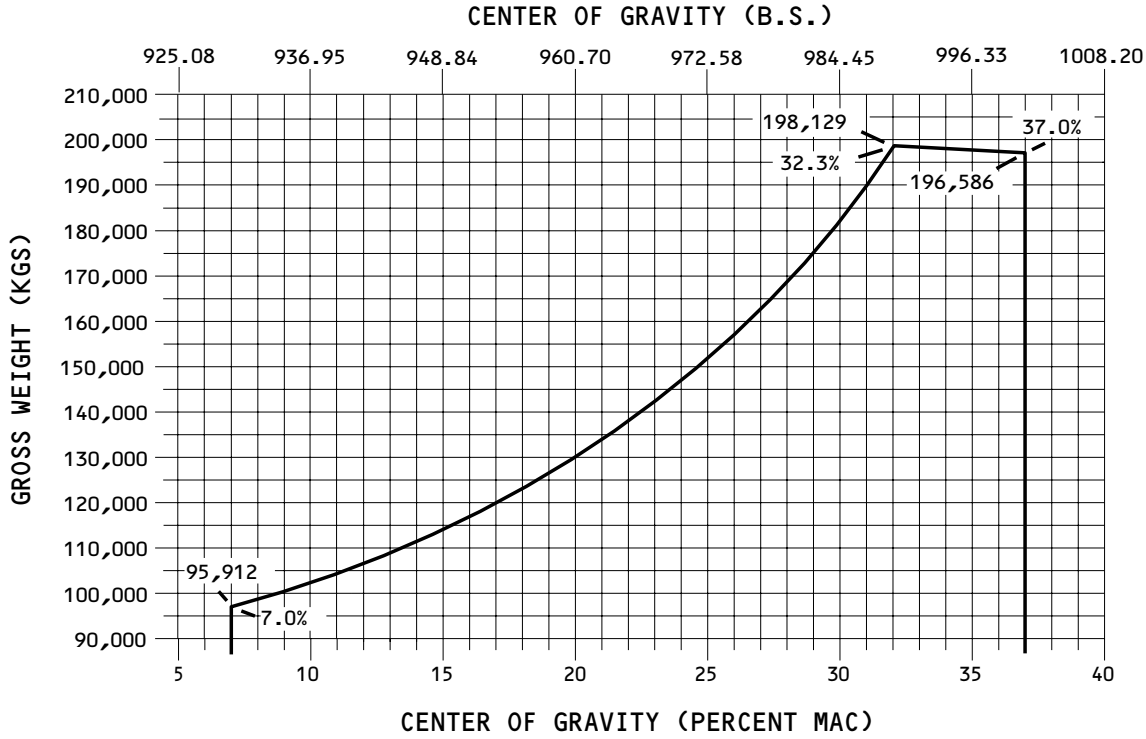
Airplane Nose Jacking Point and Jacking Adapter
Figure 201





Airplane Weight and Center of Gravity Limits for Jacking at Airplane Nose
Figure 202 (Sheet 1)





Airplane Weight and Center of Gravity Limits for Jacking at Airplane Nose
Figure 202 (Sheet 2)

S 612-005

CAUTION: DO NOT DEFLATE THE SHOCK STRUT IF YOU DO A GEAR RETRACTION TEST. THE SHOCK STRUT MUST BE FILLED CORRECTLY AND NOT INFLATED ABOVE THE CORRECT PRESSURE. DAMAGE TO THE WHEEL WELL AND SHOCK STRUT WILL OCCUR.

(6) Make sure the shock strut of the nose landing gear is filled to the correct pressure before a gear retraction test (AMM 12-15-02/301).

S 492-006

(7) Install the jack adapter (Fig. 201).
   (a) Remove the filler bolts (8) from the jack pad at jack point D. Keep the bolts because they must be installed after the jack is removed.

S 092-007

(8) Make sure the area is clear of persons, work platforms, entry stands, and other support equipment that are not necessary.

S 492-008

(9) Place wheel chocks approximately 2-4 inches away from the main landing gear wheels. This will prevent forward and aft movement of the airplane before the jack is seated.

F. Lift the Airplane Nose with an Extended Shock Strut and a Nose Jack

S 822-009

(1) Put the nose landing gear in its center position (AMM 32-51-00/001).

S 862-010

CAUTION: MAKE SURE THE AREA BELOW THE AIRPLANE IS CLEAR OF ALL EQUIPMENT BEFORE THE SHOCK STRUT IS DEFLATED. IF YOU DO NOT OBEY THESE INSTRUCTIONS, DAMAGE TO THE AIRPLANE CAN OCCUR.

(2) Deflate the shock strut of the nose landing gear (AMM 12-15-02/301).

S 612-011

(3) Inflate the shock strut of nose landing gear with the correct servicing fluid. Do the steps that follow:
   (a) Close the air-charge valve of the shock strut.
   (b) Attach the oil-charge line to the oil-charge valve of the shock strut and open the valve.

WARNING: DO NOT INFLATE THE SHOCK STRUT TO MORE THAN 2000 PSI. IF THE SHOCK STRUT IS INFLATED TO MORE THAN 2000 PSI, INJURY TO PERSONS CAN OCCUR. DAMAGE TO THE NOSE LANDING GEAR CAN ALSO OCCUR.

CAUTION: DO NOT INFLATE THE NOSE GEAR SHOCK STRUT TO AN "A" DIMENSION MORE THAN 18 INCHES. IF THE "A" DIMENSION IS MORE THAN 18 INCHES, DAMAGE TO THE SEALS CAN OCCUR.

   (c) Put the correct servicing fluid into the shock strut with a pump. Do this until it is extended to the 18 inch "A" dimension.

NOTE: Shock strut "A" dimension charts are found in AMM 12-15-02/301.

   (d) Close the oil-charge valve of the shock strut.

S 582-012

(4) To lift the airplane nose, do the steps that follow:

CAUTION: MAKE SURE YOU EXTEND THE NOSE STRUT BEFORE THE AIRPLANE NOSE IS LIFTED AT JACK POINT D. WHEN THE NOSE IS LIFTED INDEPENDENTLY AND SUFFICIENTLY FOR TIRE CLEARANCE, UNUSUAL LOADS ARE CAUSED. JACK POINT D WILL MOVE IN AN ARC ABOUT 3-1/2 INCHES AFT AND CAUSE LOADS THAT ARE MORE THAN DESIGN LOAD LIMITS. THE BEND FORCE OF THE JACK RAM IS LESS THAN THE BREAKAWAY FORCE REQUIRED TO MOVE THE MAIN LANDING GEAR TIRES. DURING SOME CONDITIONS, JACK DAMAGE AND/OR DAMAGE TO THE AIRPLANE CAN OCCUR. THIS COULD MAKE THE RETRACTION OF THE JACK RAM NOT EASY OR NOT POSSIBLE.

CAUTION: DO NOT USE THE INNER CYLINDER RETENTION STRAP ON INFLATED SHOCK STRUTS. THE RETENTION STRAP HAS A LOAD LIMIT.

   (a) Place wheel chocks approximately 2-4 inches away from all main landing gear wheels.
   (b) Do not exceed the maximum nose jack pad load of 28,000 pounds (12700 kg).

(c) Put the jack directly below the jack pad at jack point D (Fig. 201).
(d) Make sure that the jack is level and in the center of the jack adapter.
(e) Operate the jack to seat the jack in the jack adapter. Refer to the jack manufacturers' instructions.

CAUTION: DO NOT LIFT THE NOSE OF THE AIRPLANE TO MORE THAN SIX INCHES OF TIRE CLEARANCE. IF YOU LIFT THE NOSE HIGHER, SIDE LOADS THAT ARE MORE THAN DESIGN LOAD LIMITS CAN OCCUR. THIS CAN CAUSE DAMAGE TO THE JACK RAM AND JACK ADAPTER BECAUSE THEY WILL MOVE IN AN ARC.

(f) Lift the airplane nose to the necessary height.

G. Lift the Airplane Nose with the Inner Cylinder Retention Strap and Nose Jack

S 822-013
(1) Put the nose landing gear in its center position (AMM 32-51-00/001).

S 862-014

CAUTION: MAKE SURE THE AREA BELOW THE AIRPLANE IS CLEAR OF ALL EQUIPMENT BEFORE THE SHOCK STRUT IS DEFLATED. IF YOU DO NOT OBEY THESE INSTRUCTION, DAMAGE TO THE AIRPLANE CAN OCCUR.

(2) Deflate the shock strut of the nose landing gear (AMM 12-15-02/301).

S 492-015

CAUTION: DO NOT USE THE INNER CYLINDER RETENTION STRAP ON INFLATED SHOCK STRUTS. THE RETENTION STRAP HAS A LOAD LIMIT.

(3) Install the retention strap.

S 582-016
(4) To lift the airplane nose, do the steps that follow:
(a) Place wheel chocks approximately 2-4 inches away from the main landing gear wheels.

CAUTION: LET THE AIRPLANE ROLL FORWARD/AFT WHILE THE AIRPLANE NOSE IS LIFTED WITH THE JACK. WHEN YOU DO NOT LET THE AIRPLANE ROLL, DAMAGE CAN OCCUR TO THE MAIN LANDING GEAR OR TO THE AIRPLANE STRUCTURE.

(b) Make sure that the wheel chocks do not touch the wheels of the main landing gear. This is to permit forward/aft movement of the wheels while the airplane is lifted with the jack.
(c) Release the parking brake.
(d) Set the load relief cell on the jack to 28,000 pounds.

(e) Put the jack directly below the jack pad at jack point D (Fig. 201).
(f) Make sure that the jack is level and in the center of the jack adapter.
(g) Operate the jack to seat the jack in the jack adapter. Refer to the jack manufacturers' instructions.

CAUTION: DO NOT LIFT THE NOSE OF THE AIRPLANE TO MORE THAN SIX INCHES OF TIRE CLEARANCE. IF YOU LIFT THE NOSE HIGHER, SIDE LOADS THAT ARE MORE THAN DESIGN LOAD LIMITS CAN OCCUR. THIS CAN CAUSE DAMAGE TO THE JACK RAM AND JACK ADAPTER BECAUSE THEY WILL MOVE IN AN ARC.

(h) Lift the airplane nose to the necessary height.
(i) Apply the parking brake when the airplane is at the necessary height.

H. Put the Airplane Back to Its Usual Condition

S 582-017

(1) Lower the airplane nose off of the jack. Do the steps that follow:

CAUTION: MAKE SURE THE AREA BELOW THE AIRPLANE IS CLEAR OF ALL EQUIPMENT BEFORE THE AIRPLANE IS LOWERED. IF YOU DO NOT OBEY THESE INSTRUCTIONS, DAMAGE TO THE AIRPLANE CAN OCCUR.

(a) Make sure the area below the airplane is clear.
(b) Make sure the landing gear control lever is in the DN position.

CAUTION: LET THE AIRPLANE ROLL FORWARD/AFT WHILE THE AIRPLANE NOSE IS LOWERED OFF OF THE JACK. WHEN YOU DO NOT LET THE AIRPLANE ROLL, DAMAGE CAN OCCUR TO THE MAIN LANDING GEAR OR TO THE AIRPLANE STRUCTURE.

(c) Make sure that the wheel chocks do not touch the wheels of the main landing gear. This is to permit forward/aft movement of the wheels while the airplane is lowered off of the jack.
(d) Make sure the parking brake is released and the manual brake is not applied during the procedure.
(e) Lower the jack until the jack is at the bottom or until the airplane weight is on the nose gear.
(f) Move the jack away from the airplane.
(g) Remove the jack adapter.
1) Install the filler bolts (8) at jack point D on the fuselage.

S 212-024

(2) Examine the following areas of the nose jacking, body jacking, wing jacking, and tail jacking points.
(a) The examination should look for obvious signs of distress such as:
1) Local buckling of surrounding structure,

2) Cracked paint,
3) Pulled or distorted fastener heads, or local yielding of material.

S 612-018
(3) Do the servicing of the shock-strut on the nose landing gear (AMM 12-15-02/301).

S 042-020
(4) If electrical power was supplied during jacking do the steps that follow:
(a) On the PSEU (in the main equipment center, E-1 rack), push the RESET switch to erase the PSEU memory.

NOTE: Code "EEE" will be shown on the PSEU display during the erase procedure.

(b) Do the activation procedure for the flight mode simulation if you did the deactivation procedure (AMM 32-09-02/201).

JACKING AIRPLANE AXLES - MAINTENANCE PRACTICES

1. General
   A. This section gives instructions to lift the airplane at the axles. The airplane has five axle jack points. Two axle jack points are on each main landing gear. One axle jack point is on the nose landing gear. The pads of the axle jack point are all part of the landing gear.
   B. Figure 201 shows the 767 Axle Jacking System Specifications.
   C. You can lift the airplane at the axle jack points at any aircraft weight up to the maximum taxi weight.
   D. You can lift the airplane on one axle or on a combination of axles. If you use a jack on one axle, the airplane can be lifted in winds up to 35 knots. When two or more axle jacks are used, the airplane can be lifted in winds up to only 25 knots.
   E. Two flat tires on the same axle can prevent the use of standard axle jacks. If this occurs, you can use axle jacking bars to lift the axle sufficiently to install the axle jack.

TASK 07-11-03-582-001

2. Lift the Airplane on Axle Jacks
   A. Equipment
      (1) Airplane Axle Jacks - (Figure 201)
      (2) Jack (alternative or equivalent)
         (a) 8398-012 Jack - Axle, Main landing gear, 65 Ton
         Regent Manufacturing Inc. (Vendor code 02708)
         (b) 8714 Jack - Axle, MLG/NLG, 65 Ton,
         Malabar International (Vendor code 94861)
         (c) 9138-011 Jack Axle, 65 Ton
         Regent Manufacturing Inc. (Vendor code 02708)
      (3) Jack (Jacking with deflated tires)
         (a) 2150-8.5, Regent 50 ton Alligator Axle Jack
         (b) 8398-012, Regent Rhino Axle Jack
         (c) 65L4.5, Malabar Floating Beam
         (d) RL5525, Hydro-Geratabau Axle Jack
      (4) Emergency Jacking Equipment, NLG -
      A07002-12 (Recommended)
      (5) A07002-11 Emergency Jacking Equipment - NLG (Alternative)
      for airplanes with externally threaded TPIS
      (installed on line #360 and on).
      (6) A07002-1 Emergency Jacking Equipment - NLG (Alternaitve)
      for airplanes without externally threaded TPIS
      (prior to line #360).
      (7) Axle Jacking Bar Set, MLG:
         (a) A07008-19 (Recommended), Emergency jacking equipment to be used on all 767 models.
         (b) A07008-1 (Alternative), Emergency jacking equipment to be used on all 767 models, except: 767-300ER with 161T1138-10 axle, 767-300F with 161T1138-12 axle.
         (c) A07004-1 (Alternative)
         (d) A07004-8 (Alternative)
      (8) Wheel Chocks

B. References
(1) AMM 12-15-01/301, Main Gear Shock Strut
(2) AMM 12-15-02/301, Nose Gear Shock Strut
(3) AMM 32-00-20/201, Landing Gear Downlocks
(4) AMM 32-42-06/401, Antiskid Transducer

C. Prepare to Lift the Airplane on Axle Jacks

S 702-020
(1) Make sure the parking brake is set.

S 492-002
(2) Make sure the down locks are installed on the nose and main landing gear (AMM 32-00-20/201).

S 862-012
(3) Make sure the airplane center of gravity is within the aircraft tipping limit.

S 862-016
(4) Use Fig. 201 to determine the 767 Axle Jacking System Specifications.

S 582-004

CAUTION: DO NOT LIFT THE AIRPLANE IN WINDS MORE THAN 35 KNOTS IF YOU USE ONLY ONE AXLE JACK. IF YOU DO NOT OBEY THESE INSTRUCTIONS, DAMAGE TO THE AIRPLANE CAN OCCUR.

CAUTION: DO NOT LIFT THE AIRPLANE IN WINDS MORE THAN 25 KNOTS IF YOU USE TWO OR MORE AXLE JACKS. IF YOU DO NOT OBEY THESE INSTRUCTIONS, DAMAGE TO THE AIRPLANE CAN OCCUR.

(5) Make sure the airplane is turned into the wind when it is out of the hangar.

S 582-005

CAUTION: MOVE THE AIRPLANE STRAIGHT FORWARD A MINIMUM OF 10 FEET BEFORE YOU LIFT IT ON THE JACKS. DO THIS IF THE AIRPLANE WAS STOPPED OR PARKED WHILE IT WAS IN A TURN. SIDE LOAD PRESSURES ON THE LANDING GEAR TRUCKS CAUSED BY SCRUBBED TIRES CAN CAUSE THE AXLE JACK TO FALL.

(6) Make sure that the torsion loads (side load pressures) are released before the airplane axles are lifted on jacks.

NOTE: Move the airplane a minimum of 10 feet before you lift the airplane on jacks.

S 612-006

(7) Make sure that the shock struts of the main landing gear are inflated to the correct pressure (AMM 12-15-01/301).

S 612-007

(8) Make sure that the shock strut of the nose landing gear is inflated to the correct pressure (AMM 12-15-02/301).

D. Use the Axle Jack with Inflated Tires

S 582-008

(1) When the tires are not deflated, put the jack(s) directly below the jack pad(s) on the landing gear axles. Do the steps that follow:
   (a) Examine all of the wheels, on the axles that are not being lifted with the jack.
   (b) Put wheel chocks at the inflated tires of the truck or nose tires that are not being lifted with the jack. Place wheel chocks about 3 inches away from the tires.
   (c) Release the parking brake.
   (d) Operate the axle jack(s) to lift the airplane wheel(s) to the necessary height.

CAUTION: IF GUSTY CROSSWINDS ARE ENCOUNTERED WHILE NOSE GEAR IS ON AXLE JACK, AXLE ROTATION ABOUT THE JACK CONE MAY BE EXPERIENCED DUE TO AIRPLANE WEATHERVANING. AIRPLANE MOVEMENT MAY BE DECREASED BY APPLYING PARKING BRAKES. PARKING BRAKES MUST BE RELEASED BEFORE LOWERING THE AIRPLANE. WHEN THERE ARE SEVERE GUSTY WINDS, IT IS RECOMMENDED YOU LOWER THE AIRPLANE AS SOON AS POSSIBLE. AN OPTIONAL METHOD TO PREVENT THE AXLE FROM TURNING IS TO STATION A PERSON IN THE CONTROL CABIN, TO MONITOR THAT STEERING CONTROLS ARE NOT MOLESTED, AND TEMPORARILY REMOVE THE STEERING LOCKOUT PIN. IF REMOVED, INSERT THE LOCKOUT PIN AS SOON AS POSSIBLE AFTER MAINTENANCE IS DONE AND BEFORE YOU LOWER THE JACK.

1) Refer to the jack manufacturers' instructions.

S 862-013

(2) Do not exceed the jack point load limits (Fig. 201).

E. Use the Axle Jack with Deflated Tires

S 582-010

(1) When the tires are deflated on the landing gear axle (not sufficient clearance to install the axle jack) that will be lifted, do the steps that follow:
   (a) Put wheel chocks at the inflated tires of the truck or nose tires that are not being lifted with the jack. Place wheel chocks about 3 inches away from the tires.

(b) If the axles of the main landing gear will be lifted on jacks, remove the antiskid transducer (AMM 32-42-06/401).
1) Do this on the axle(s) that will be lifted with the jack(s).
(c) FOR AIRPLANES THAT HAVE NOSE GEAR AXLE WITH EXTERNAL AXLE NUT THREADS;
If the axle of the nose landing gear will be lifted on jacks, remove the nut (2), the washer (3) and the lockbolt (4), two locations. (Fig. 202)

CAUTION: MAKE SURE YOU USE AUXILIARY JACKING BARS IN PAIRS. IF YOU LIFT THE AIRPLANE WITH ONE JACKING BAR, YOU CAN CAUSE DAMAGE TO THE AXLE.

(d) Install the auxiliary jacking bars.
(e) Lift the axle until the axle jack can be installed below the jack pad.
(f) Put the axle jack directly below the jack pad.
(g) Remove the auxiliary jacking bars.
(h) Release the parking brake.

CAUTION: WHEN YOU LIFT ONE AXLE WITH THE JACK, DO NOT LIFT THE AXLE MORE THAN 14 INCHES HIGHER THAN THE OTHER AXLE. IF YOU LIFT THE AXLE TOO HIGH YOU CAN PUT TOO MUCH LOAD ON THE TRUCK POSITION ACTUATOR OF THE MAIN LANDING GEAR. THIS CAN CAUSE DAMAGE TO THE TRUCK POSITION ACTUATOR.

(i) Operate the axle jack(s) to lift the airplane wheel(s) to the necessary height.

CAUTION: IF GUSTY CROSSWINDS ARE ENCOUNTERED WHILE NOSE GEAR IS ON AXLE JACK, AXLE ROTATION ABOUT THE JACK CONE MAY BE EXPERIENCED DUE TO AIRPLANE WEATHERVANING. AIRPLANE MOVEMENT MAY BE DECREASED BY APPLYING PARKING BRAKES. PARKING BRAKES MUST BE RELEASED BEFORE LOWERING THE AIRPLANE. WHEN THERE ARE SEVERE GUSTY WINDS, IT IS RECOMMENDED YOU LOWER THE AIRPLANE AS SOON AS POSSIBLE. AN OPTIONAL METHOD TO PREVENT THE AXLE FROM TURNING IS TO STATION A PERSON IN THE CONTROL CABIN, TO MONITOR THAT STEERING CONTROLS ARE NOT MOLESTED, AND TEMPORARILY REMOVE THE STEERING LOCKOUT PIN. IF REMOVED, INSERT THE LOCKOUT PIN AS SOON AS POSSIBLE AFTER MAINTENANCE IS DONE AND BEFORE YOU LOWER THE JACK.

1) Refer to the jack manufacturers' instructions.

S 862-014
(2) Do not exceed the jack point load limits (Fig. 201).

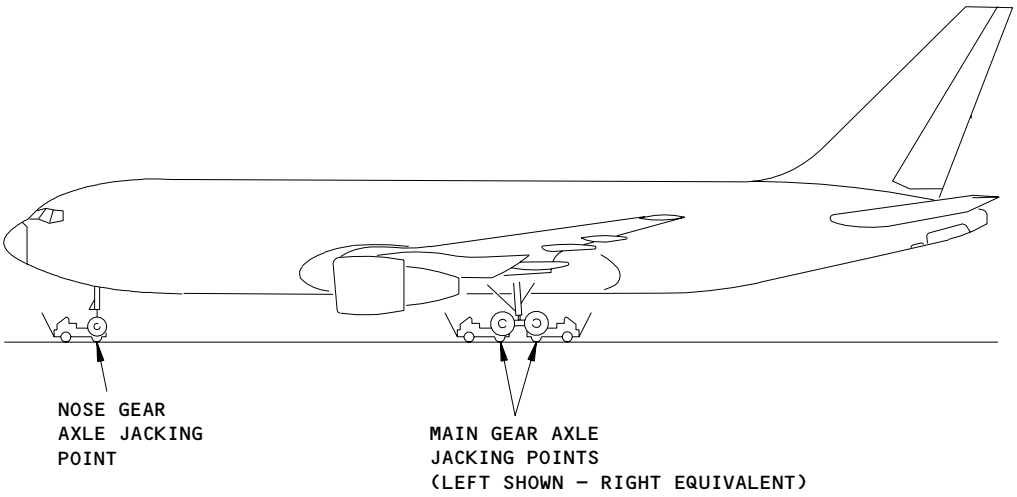
F. Put the Airplane Back to Its Initial Condition

S 582-011

(1) Lower the airplane off of the axle jack.
    (a) Refer to the jack manufacturers' instructions.
    (b) Remove the axle jack(s) from under the axle(s).

S 702-021

(2) Apply the parking brake, if necessary.



JACKING POINT		JACK SPECIFICATIONS			
		MAXIMUM LOAD (POUNDS) 1	JACK HEIGHT (INCHES) 7		ADAPTER FITTING
			ROLL–UNDER 6	EXTENDED 4	
GEAR AXLE	MAIN	105,000	5.0 2	17.5 5	NONE
			11.5 3		
	NOSE	50,000	6.6 2	17.5	NONE
			11.3 3		

1 INCLUDES 35 KNOT WIND LOAD FOR A SINGLE JACK AND 25 KNOT WIND LOAD FOR TWO OR MORE JACKS

2 TIRES FLAT WITH 0.5–INCH ROLL–UNDER CLEARANCE

3 TIRES INFLATED CORRECTLY

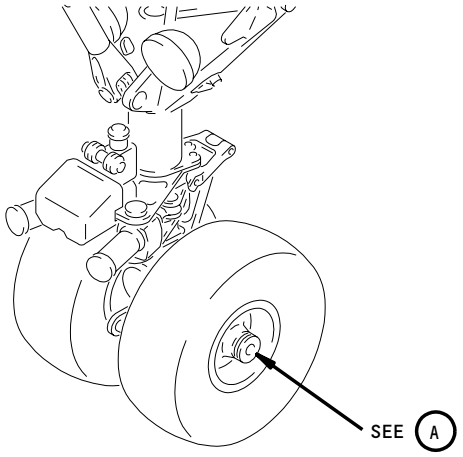
4 EXTENDED HEIGHT PERMITS 2–INCH GROUND CLEARANCE

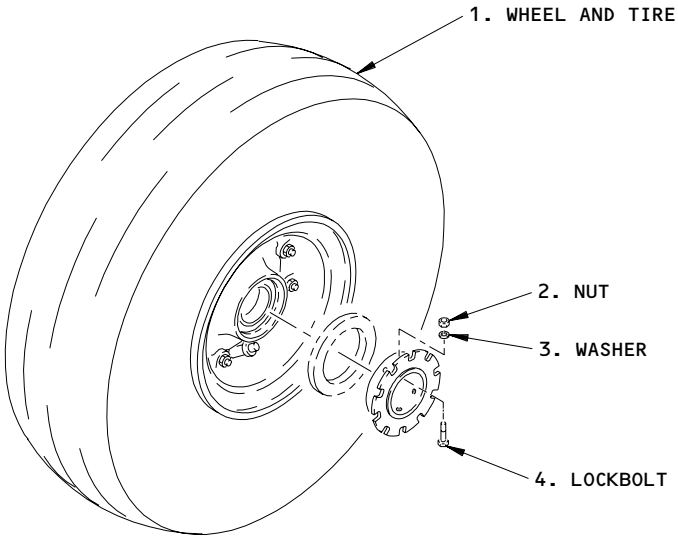
5 CAUTION: WHEN JACKING ONE AXLE ONLY, DO NOT JACK THE AXLE MORE THAN 14 INCHES HIGHER THAN THE OTHER AXLE. THIS WILL PREVENT DAMAGE TO THE TRUCK POSITIONER ACTUATOR.

6 ROLL–UNDER IS THE MINIMUN DISTANCE BETWEEN THE TOP OF THE AXLE JACK AND THE JACK PADS ON THE LANDING GEAR AXLE

7 JACK HEIGHT IS MEASURED FROM THE CENTER OF THE LANDING GEAR AXLE TO THE GROUND

Axle Jacking System Specifications
Figure 201





Nose Gear Axle Lockbolt Location
Figure 202

EFFECTIVITY
AIRPLANES THAT HAVE NOSE GEAR AXLE WITH EXTERNAL AXLE NUT THREADS

1521227

JACKING FOR AIRPLANE SUPPORT WITH ENGINE(S) REMOVED - MAINTENANCE PRACTICES

1. General
   A. Jacks are not necessary to keep the airplane stable during engine removal. This is possible if the airplane gross weight and center of gravity (CG) are in the SAFE ZONE limits. The SAFE ZONE limits are specified in Figure 201 and Figure 202.

   TASK 07-11-05-582-001

2. Make the Airplane Stable to Prevent Tipping
   A. General
      (1) Find the airplane gross weight.
          (a) Use the approved weight reports and procedures.
      (2) Find the airplane center of gravity (CG) for the applicable airplane configuration. Use component weight and CG data and calculation procedures in the approved weight and balance manuals. Make sure you know the location of all airplane components and equipment. This includes support and test equipment that was removed, installed, or put in a different position in the airplane.
      (3) Use the gross weight and CG data to find the weight and CG point of operation in Figure 201 and Figure 202.

      CAUTION: THE GROUND STABILITY LIMITS DO NOT PERMIT THE REMOVAL OF OTHER COMPONENTS. THEY ALSO DO NOT PERMIT THE MOVEMENT OF PERSONS AND EQUIPMENT IN OR NEAR THE AFT END OF THE FUSELAGE. ALL NECESSARY PRECAUTIONS MUST BE FOLLOWED.

      (4) The airplane will stay stable after an engine removal if the point of operation is in the SAFE ZONE. But, the point of operation must be in the SAFE ZONE below the GROUND STABILITY LIMIT line.

          NOTE: In the hangar, the airplane will be sufficiently stable to permit some movement of persons in the airplane. It will also permit the controlled removal of components. This is also correct if the airplane is in a no-wind condition. The lower the operation point is below the GROUND STABILITY LIMIT line, the more stable the airplane becomes after engine removal.

   B. References
      (1) AMM 07-11-01/201, Jacking Airplane

C. Procedures

S 492-002

(1) If the operation point is in the CAUTION ZONE, and above the GROUND STABILITY LIMIT line, make the airplane stable. Use one of the procedures that follow (AMM 07-11-02/201):

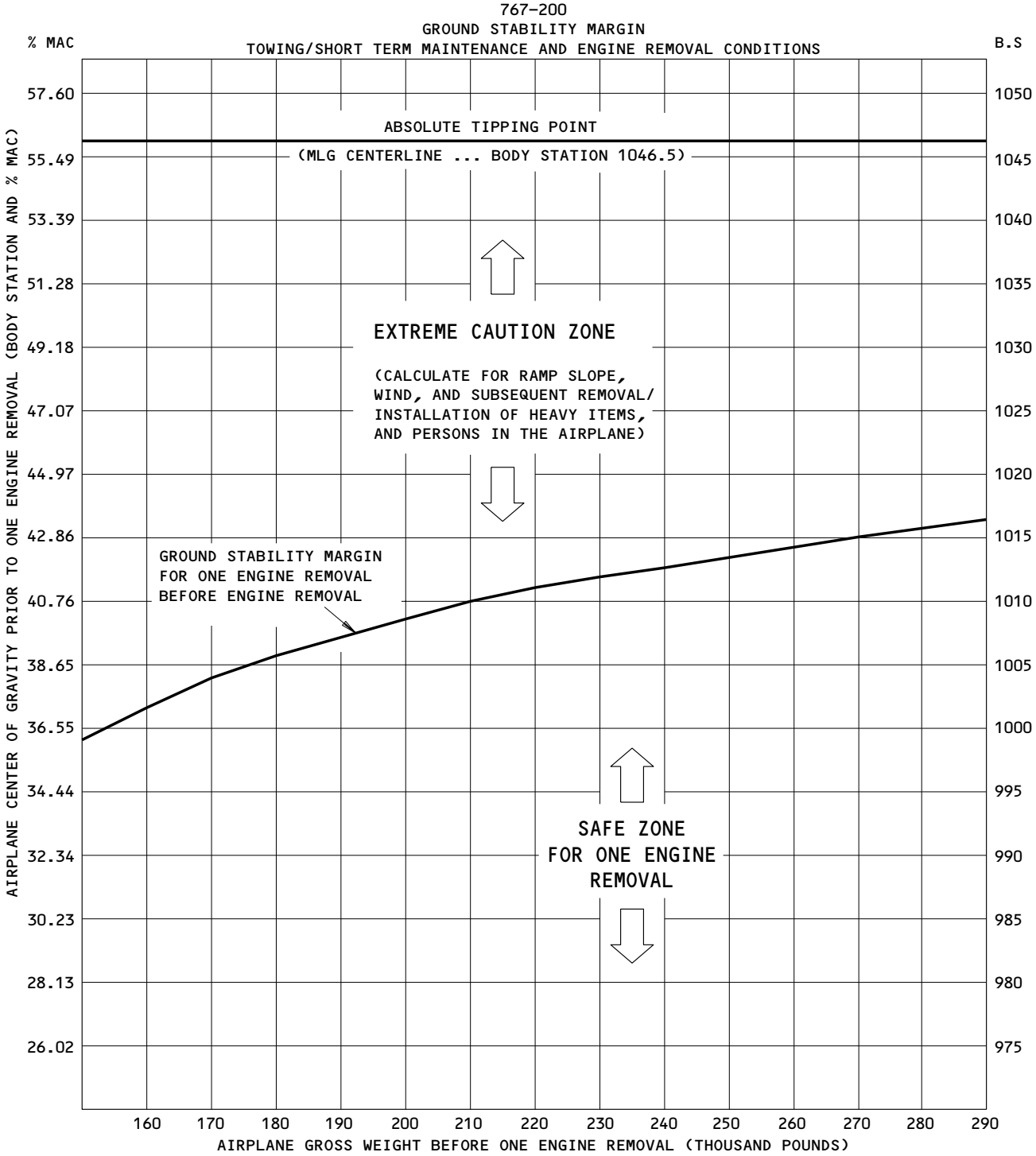
(a) Use accepted weight and CG procedures to move the point of operation into the SAFE ZONE.

NOTE: On a two engine removal, the best possible solution might be, to remove and install one engine at a time. Do this to get a point of operation satisfactory for maintenance.

(b) Install the airplane jack at the tail jack point to prevent airplane tipping.

TIPPING OF 767 AIRPLANE

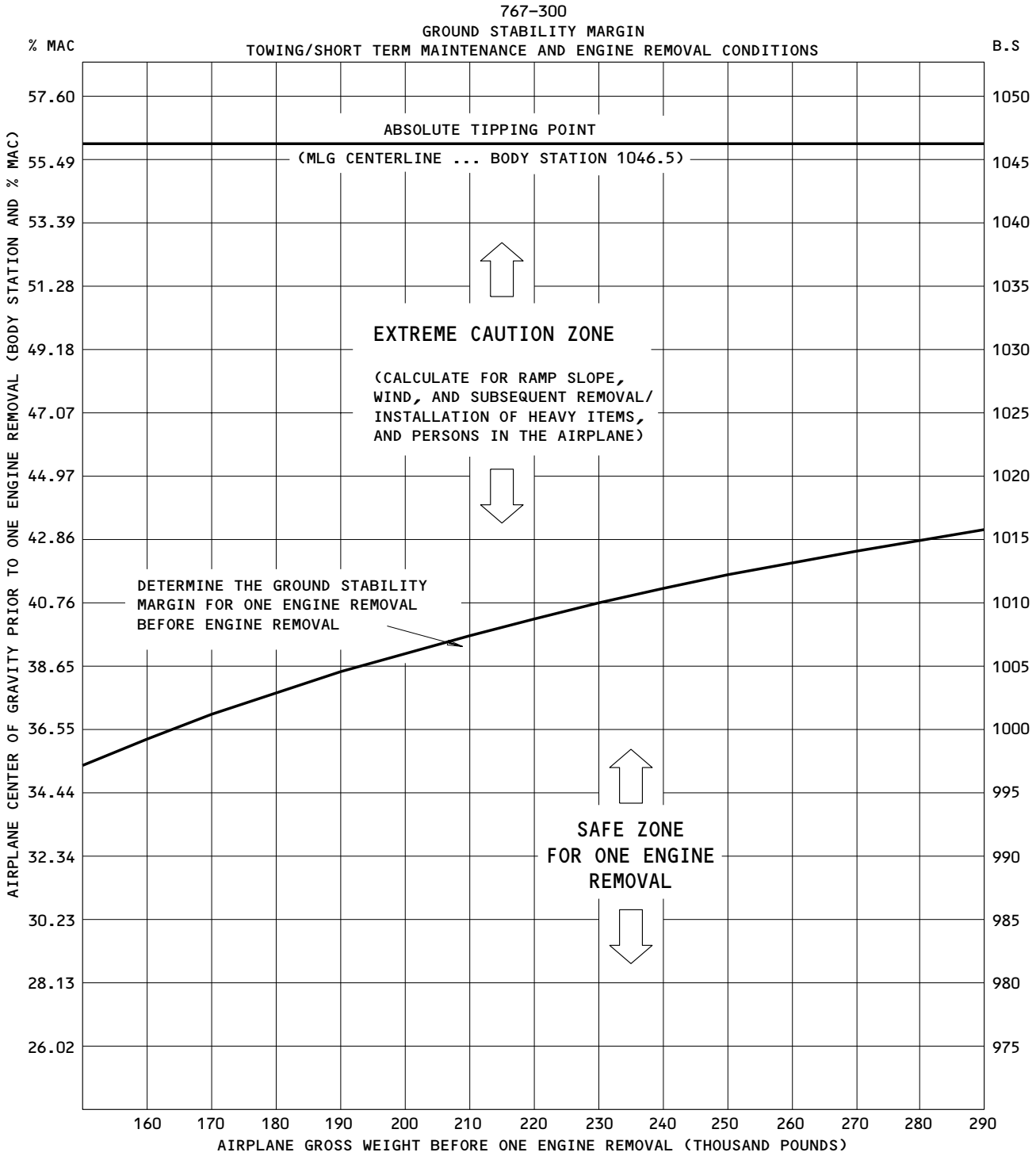
THE CHART BELOW SHOWS THE 767-200 TIPPING LIMITS. THE ABSOLUTE TIPPING LIMIT IS THE MLG CENTERLINE AT B.S. 1046.5. THE GROUND STABILITY MARGIN LINE SHOWS THE ABSOLUTE TIPPING LIMIT TO ACCOUNT FOR FACTORS SUCH AS TOWING FORCES, RAMP SLOPE AND WIND. WHEN YOU MAKE SURE THAT THE AIRPLANE WEIGHT AND C.G. DURING MAINTENANCE OPERATIONS IS BELOW THIS LINE, A TIPPING CONDITION WILL BE PREVENTED



Center of Gravity and Gross Weight Limits for Removal of One Engine
Figure 201 (Sheet 1)

TIPPING OF 767 AIRPLANE

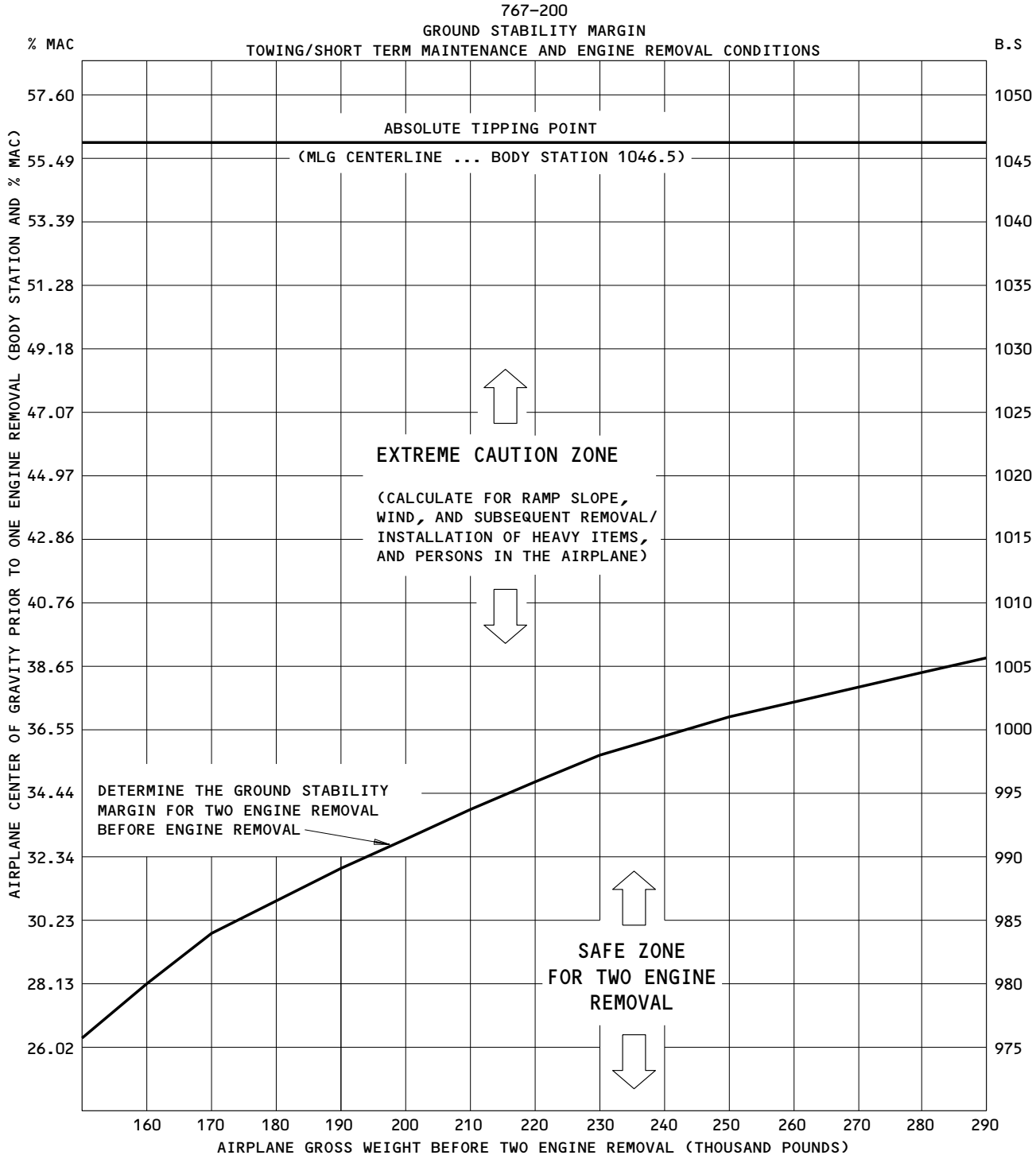
THE CHART BELOW SHOWS THE 767-300 TIPPING LIMITS. THE ABSOLUTE TIPPING LIMIT IS THE MLG CENTERLINE AT B.S. 1046.5. THE GROUND STABILITY MARGIN LINE SHOWS THE ABSOLUTE TIPPING LIMIT TO ACCOUNT FOR FACTORS SUCH AS TOWING FORCES, RAMP SLOPE AND WIND. WHEN YOU MAKE SURE THAT THE AIRPLANE WEIGHT AND C.G. DURING MAINTENANCE OPERATIONS IS BELOW THIS LINE, A TIPPING CONDITION WILL BE PREVENTED



Center of Gravity and Gross Weight Limits for Removal of One Engine
Figure 201 (Sheet 2)

TIPPING OF 767 AIRPLANE

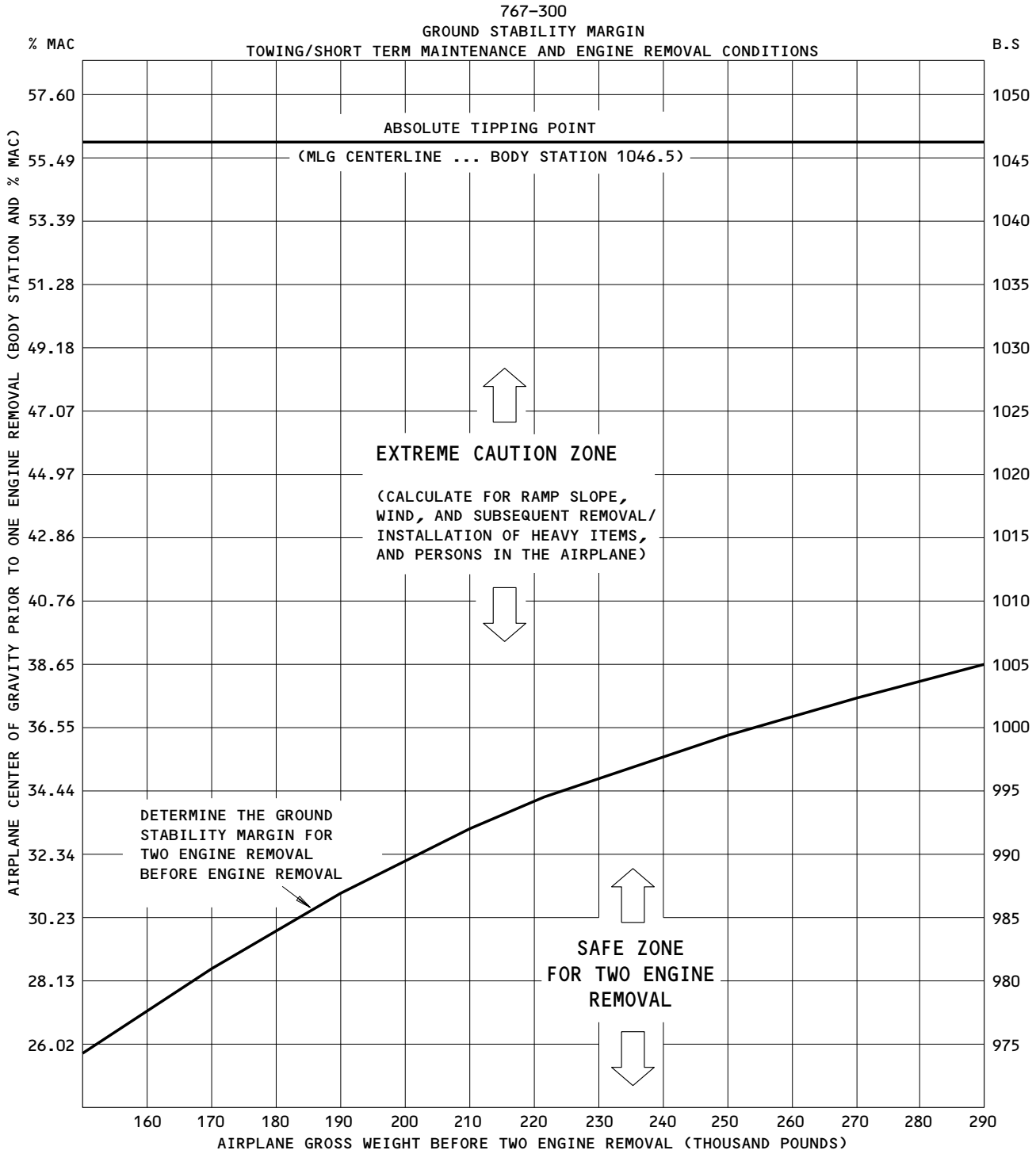
THE CHART BELOW SHOWS THE 767-200 TIPPING LIMITS. THE ABSOLUTE TIPPING LIMIT IS THE MLG CENTERLINE AT B.S. 1046.5. THE GROUND STABILITY MARGIN LINE SHOWS THE ABSOLUTE TIPPING LIMIT TO ACCOUNT FOR FACTORS SUCH AS TOWING FORCES, RAMP SLOPE AND WIND. WHEN YOU MAKE SURE THAT THE AIRPLANE WEIGHT AND C.G. DURING MAINTENANCE OPERATIONS IS BELOW THIS LINE, A TIPPING CONDITION WILL BE PREVENTED



Center of Gravity and Gross Weight Limits for Removal of Two Engines
Figure 202 (Sheet 1)

TIPPING OF 767 AIRPLANE

THE CHART BELOW SHOWS THE 767-300 TIPPING LIMITS. THE ABSOLUTE TIPPING LIMIT IS THE MLG CENTERLINE AT B.S. 1046.5. THE GROUND STABILITY MARGIN LINE SHOWS THE ABSOLUTE TIPPING LIMIT TO ACCOUNT FOR FACTORS SUCH AS TOWING FORCES, RAMP SLOPE AND WIND. WHEN YOU MAKE SURE THAT THE AIRPLANE WEIGHT AND C.G. DURING MAINTENANCE OPERATIONS IS BELOW THIS LINE, A TIPPING CONDITION WILL BE PREVENTED.



Center of Gravity and Gross Weight Limits for Removal of Two Engines
Figure 202 (Sheet 2)

REMOVAL OF ENGINES WHILE AIRPLANE IS ON JACKS - MAINTENANCE PRACTICES

1. General
   A. Keep the airplane stable during engine removal. This is only possible if the airplane gross weight and center of gravity (CG) are in the SAFE ZONE limits. The gross weight and center of gravity limits and the criteria for jacking (SAFE ZONE limits) are specified in:
      (1) 767-200 Airplanes
          Fig. 201
      (2) 767-300 Airplanes
          Fig. 201A
      (3) 767-400 Airplanes
          Fig. 201B

TASK 07-11-06-072-001

2. Make the Airplane Stable to Prevent Tipping
   A. General
      (1) Find the airplane gross weight.
          (a) Use the approved weight reports and procedures.
      (2) Find the airplane center of gravity (CG) for the applicable airplane configuration. Use component weight and CG data and calculation procedures in the approved weight and balance manuals. Make sure you know the location of all airplane components and equipment. This includes support and test equipment that was removed, installed, or put in a different position in the airplane.
      (3) Use the gross weight and CG data to find the weight and CG point of operation in:
          (a) 767-200 Airplanes
              Fig. 201
          (b) 767-300 Airplanes
              Fig. 201A
          (c) 767-400 Airplanes
              Fig. 201B

      WARNING: THE GROUND STABILITY LIMITS DO NOT PERMIT THE REMOVAL OF OTHER COMPONENTS AND MUST BE DONE INSIDE OR IN AN ENVIRONMENT THAT DOES NOT HAVE ANY WIND . THEY ALSO DO NOT PERMIT THE MOVEMENT OF PERSONS AND EQUIPMENT IN OR NEAR THE AFT END OF THE FUSELAGE. FAILURE TO FOLLOW THIS WARNING CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

      (4) Obey this warning during all of this task.
      (5) The airplane will stay stable after an engine removal if the point of operation is in the SAFE ZONE. But the point of operation must be in the SAFE ZONE below the GROUND STABILITY LIMIT line.

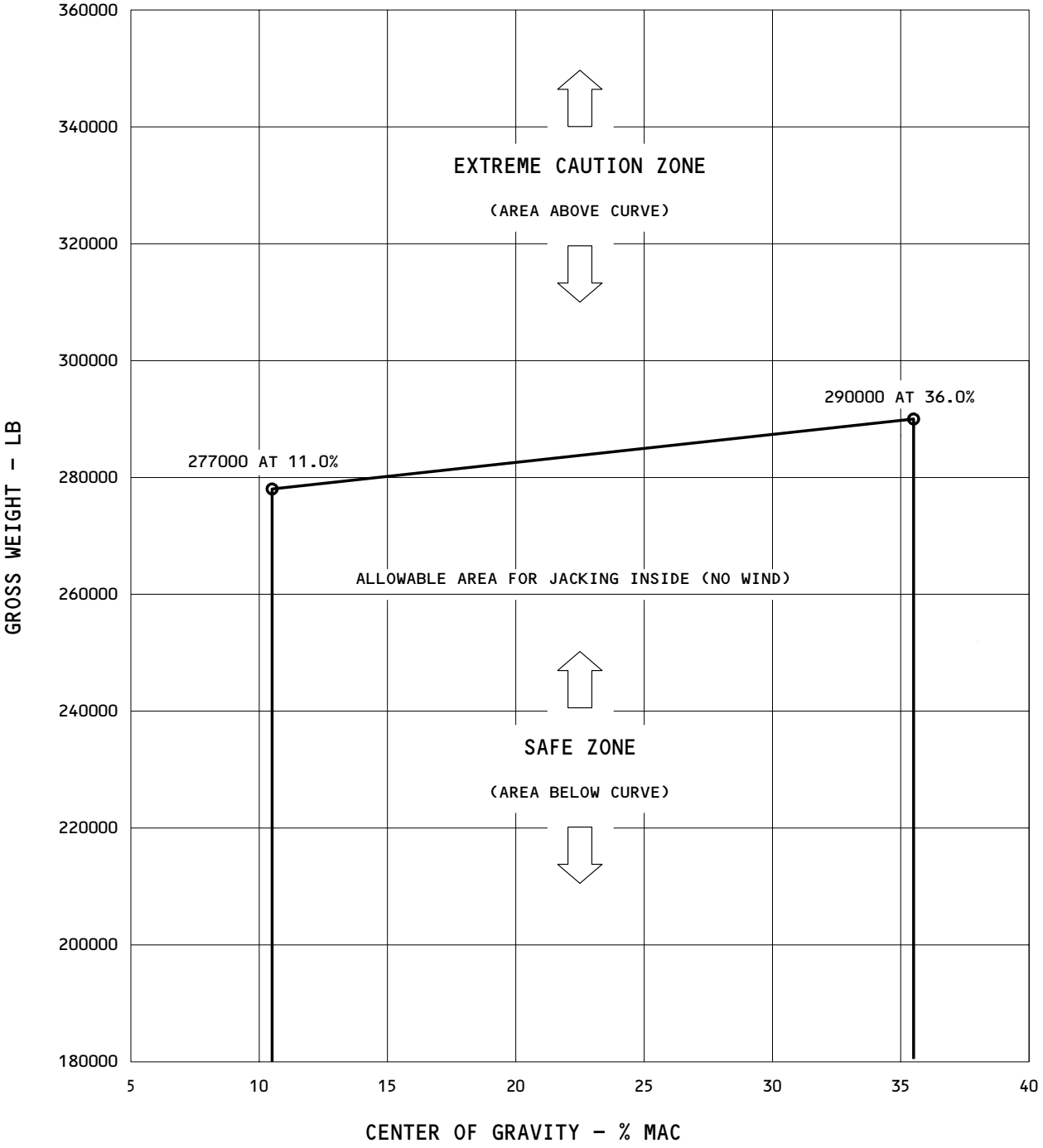
B. References
(1) AMM 07-11-01/201, Jacking Airplane
(2) AMM 07-11-05/201, Jacking for Airplane Support with Engines Removed

C. Procedures

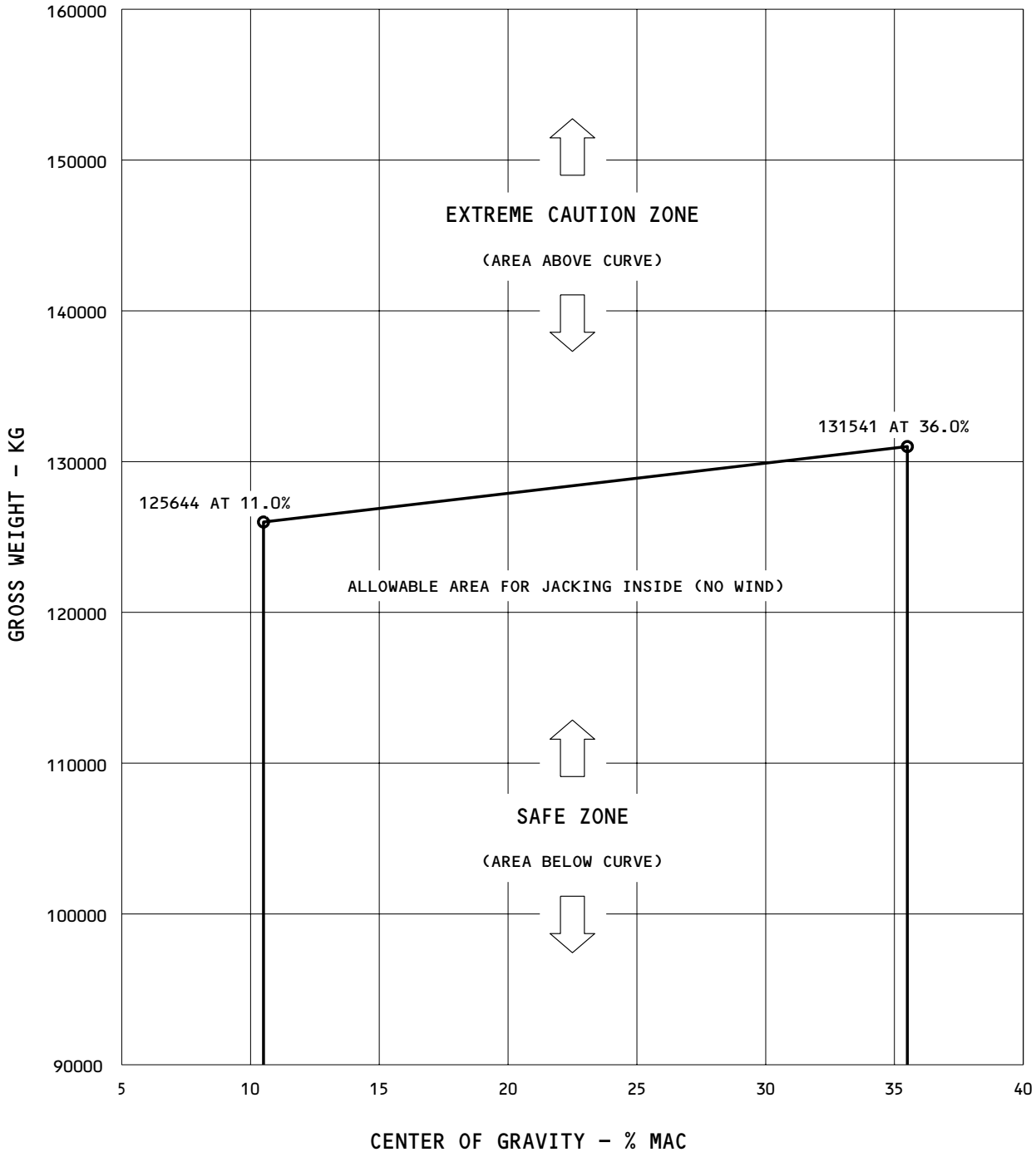
S 022-004

WARNING: THE GROUND STABILITY LIMITS DO NOT PERMIT THE REMOVAL OF OTHER COMPONENTS AND MUST BE DONE INSIDE OR IN AN ENVIRONMENT THAT DOES NOT HAVE ANY WIND . THEY ALSO DO NOT PERMIT THE MOVEMENT OF PERSONS AND EQUIPMENT IN OR NEAR THE AFT END OF THE FUSELAGE. FAILURE TO FOLLOW THIS WARNING CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

(1) Do not attempt removal of engines if operation point is in the CAUTION ZONE, and above the GROUND STABILITY LIMIT line.
(a) Use the given gross weight and center of gravity limits for jacking (SAFE ZONE limits) in this procedure:
1) Jack the airplane per AMM 07-11-01/201.
2) Install the airplane jack at the tail jack point to prevent airplane tipping.



Gross Weight and Center of Gravity Limits for Jacking
Jacking at Primary Points Prior to Engine Removal
Figure 201 (Sheet 1)



Gross Weight and Center of Gravity Limits for Jacking
Jacking at Primary Points Prior to Engine Removal
Figure 201 (Sheet 2)

POINT	BODY STATION	BUTTOCK LINE	DENSITY	WEIGHT
				277000
POINT I	784.5	-97.4	7.1 LB/GAL	284000
POINT II	784.5	97.4		290000
POINT III	1725.3	-35.9		

DESCRIP-TION	WEIGHT	X-CG INCHES	X-CG %MAC	Y-CG INCHES	LOAD AT POINT I	LOAD AT POINT II	LOAD AT POINT III	MAX LO AT POINT I	MAX LO AT POINT II	MAX LO AT POINT III	OVER/ UNDER MAX, PT I	OVER/ UNDER MAX, PT II	OVER/ UNDER MAX, PT III
GROSS WEIGHT AT PRIMARY JACK POINTS	277000 (125,644)	939.3	11.0	0.0	107306	124108	45585	135000	150000	67000	-27694	-25892	-21415
GROSS WEIGHT AT PRIMARY JACK POINTS	284000 (128,822)	968.5	23.3	0.0	103984	124461	55556	135000	150000	67000	-31016	-25539	-11444
GROSS WEIGHT AT PRIMARY JACK POINTS	290000 (131,541)	998.7	36.0	0.0	99818	124155	66027	135000	150000	67000	-35182	-25845	-973
REMOVE E1 (ROLLS ROYCE)	-23000 (-10,433)	828.5		-310.1									
GROSS WEIGHT AT 11% MAC, E1 REMOVED	254000 (115,214)	949.4		28.1	59929	149561	44509	150000	150000	67000	-90071	-439	-22491
GROSS WEIGHT AT 23.3%, E1 REMOVED	261000 (118,390)	980.9		27.3	56606	149914	54480	150000	150000	67000	-93394	-86	-12520
GROSS WEIGHT AT 36%, E1 REMOVED	267000 (121,111)	1013.4		26.7	52441	149608	64951	150000	150000	67000	-97559	-392	-2049

Gross Weight and Center of Gravity Limits for Jacking
Jacking at Primary Points Prior to Engine Removal
Figure 201 (Sheet 3)

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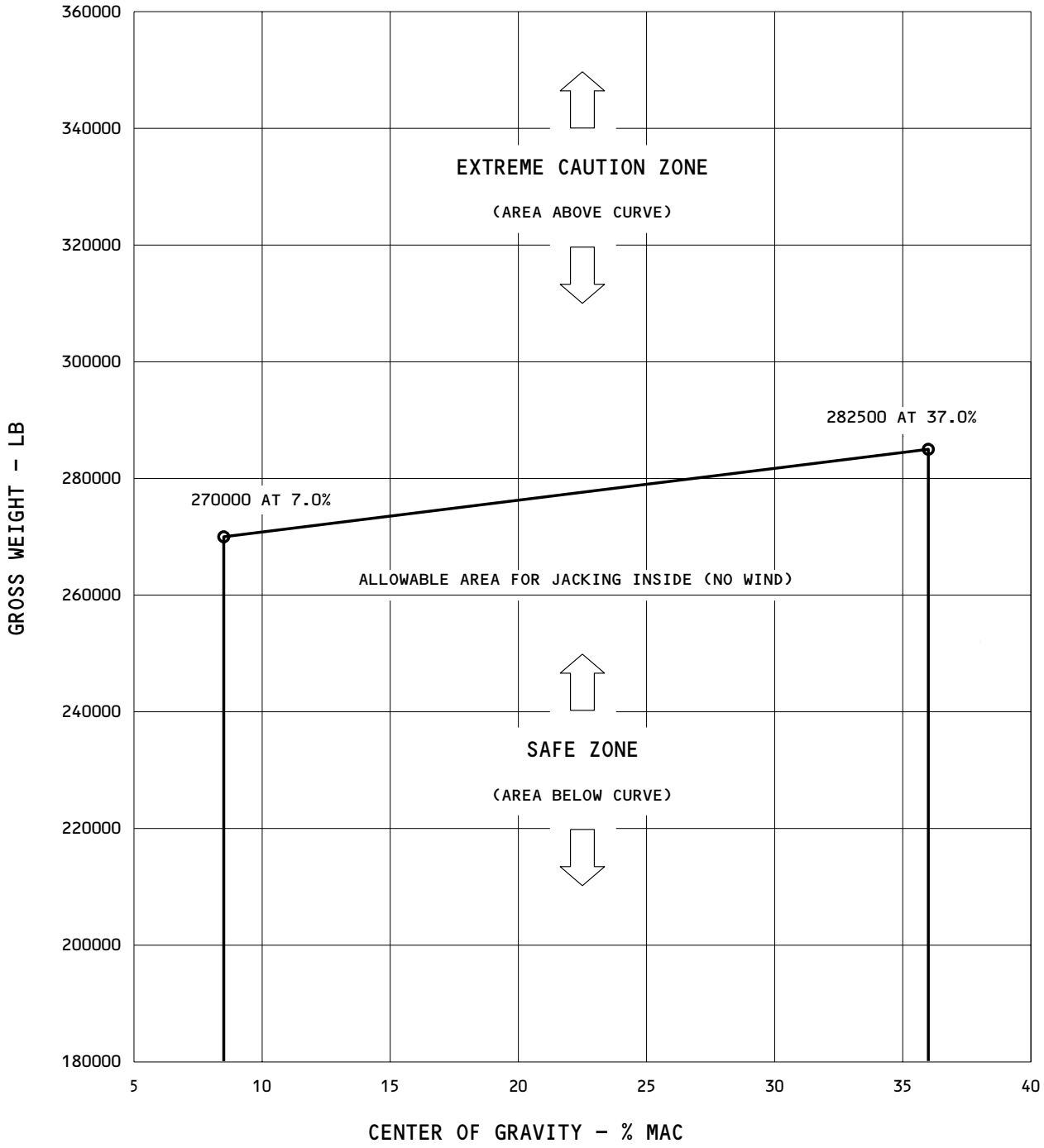
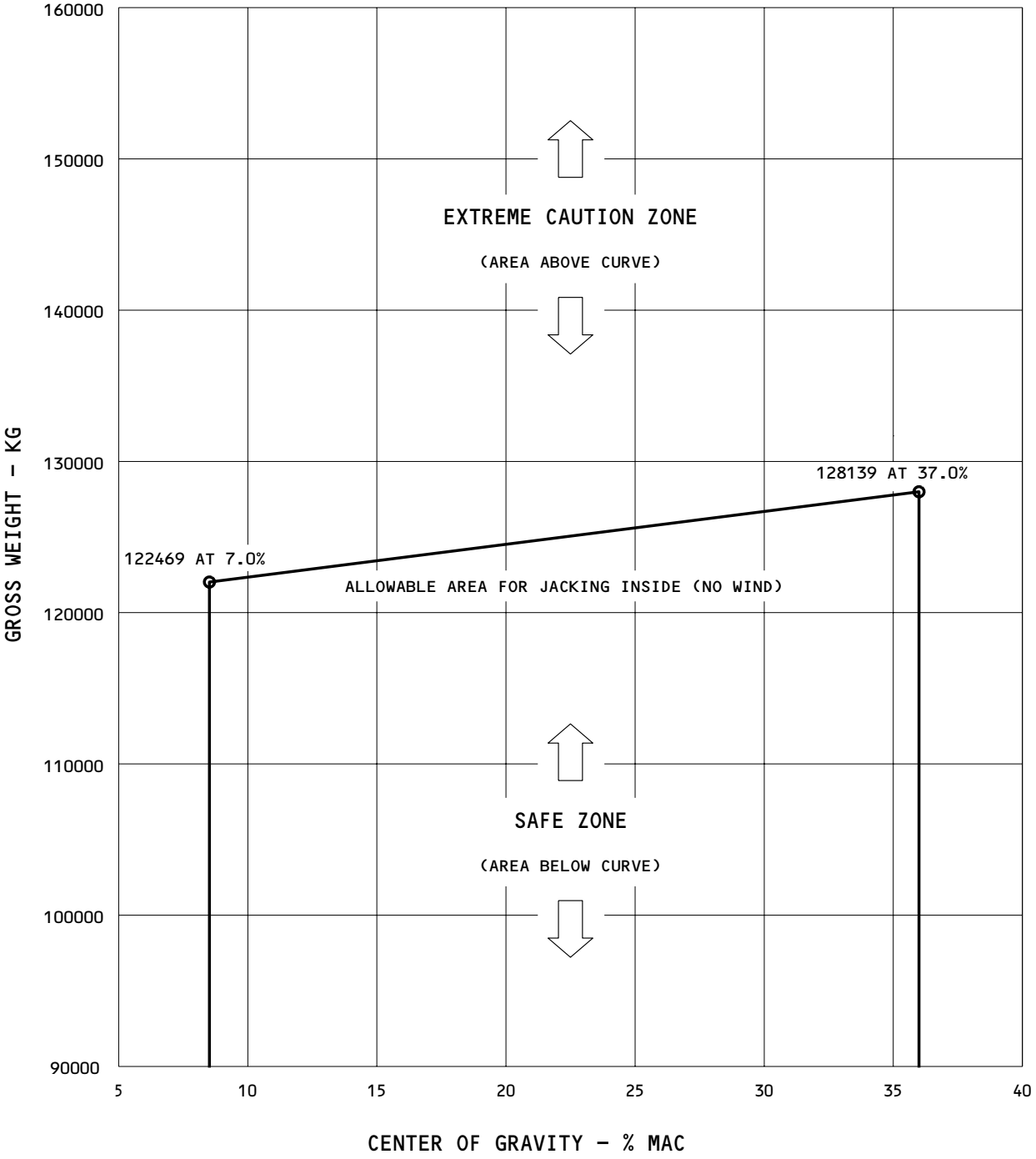


Gross Weight and Center of Gravity Limits for Jacking
Jacking at Primary Points Prior to Engine Removal
Figure 201A (Sheet 1)



Gross Weight and Center of Gravity Limits for Jacking
Jacking at Primary Points Prior to Engine Removal
Figure 201A (Sheet 2)

POINT	BODY STATION	BUTTOCK LINE	DENSITY	WEIGHT
				270000
POINT I	784.5	-97.4	7.1 LB/GAL	280000
POINT II	784.5	97.4		282500
POINT III	1857.3	-35.9		

DESCRIP-TION	WEIGHT	X-CG INCHES	X-CG %MAC	Y-CG INCHES	LOAD AT POINT I	LOAD AT POINT II	LOAD AT POINT III	MAX LO AT POINT I	MAX LO AT POINT II	MAX LO AT POINT III	OVER/ UNDER MAX, PT I	OVER/ UNDER MAX, PT II	OVER/ UNDER MAX, PT III
GROSS WEIGHT AT PRIMARY JACK POINTS	270000 (122,469)	929.8	7.0	0.0	109972	123453	36575	150000	150000	67000	-40028	-26547	-30425
GROSS WEIGHT AT PRIMARY JACK POINTS	280000 (127,008)	994.4	34.2	0.0	102507	122702	54790	150000	150000	67000	-47493	-27298	-12210
GROSS WEIGHT AT PRIMARY JACK POINTS	282500 (282,500)	1001.1	37.0	0.0	102224	123245	57031	150000	150000	67000	-47776	-26755	-9969
REMOVE E1 (ROLLS ROYCE)	-23000 (-10,433)	828.5		-310.1									
GROSS WEIGHT AT 7% MAC, E1 REMOVED	247000 (112,039)	939.3		28.9	62504	148864	35632	150000	150000	67000	-87496	-1136	-31368
GROSS WEIGHT AT 34.2%, E1 REMOVED	257000 (116,575)	1009.3		27.8	55040	148114	53847	150000	150000	67000	-94960	-1886	-13153
GROSS WEIGHT AT 37%, E1 REMOVED	259500 (117,709)	1016.4		27.5	54756	148656	56087	150000	150000	67000	-95244	-1344	-10913

Gross Weight and Center of Gravity Limits for Jacking
Jacking at Primary Points Prior to Engine Removal
Figure 201A (Sheet 3)

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