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CHAPTER 07 - LIFTING AND SHORING

TABLE OF CONTENTS

# LIFT AIRPLANE FOR MAINTENANCE - DESCRIPTION AND OPERATION

1. General

A. The airplane is provided with three primary jack points and five stabilizing jack points. Primary jack points are at left and right wing to body junction and at the tail. The five stabilizing jack points are at the nose, center of each wing, and at each wingtip. The jack at each wingtip is a lift point to raise the wing for maintenance functions. In addition, there is a jack point under the nose gear axle and two jack points under each main gear truck. Maximum allowable loads specified in individual procedures should not be exceeded. An adapter is required at some jack points.

B. Any jack or jack system which satisfies the jacking requirements may be used to jack the airplane. Currently, systems produced by Regent Malabar, Columbus, Hydro-Geratebau, and Skyhi are among those systems. Operate jacks in accordance with the manufacturer's instructions.

CAUTION: DO NOT LIFT AIRPLANE AT WEIGHTS ABOVE 474,000 POUNDS AS THIS WILL OVERLOAD INDIVIDUAL JACK POINTS. TO DO SO MAY CAUSE STRUCTURAL DAMAGE TO THE AIRPLANE.

C. The airplane at any gross weight between 300,000 and 474,000 pounds may be raised or lowered using primary jack points provided CG is maintained. The airplane may be supported or stabilized on jacks at weights equivalent to a basic airplane (350,000 pounds) plus full inboard main tanks (at 7 pounds per gallon), so long as individual jack point loads and CG locations are not exceeded. This provides for adding weight after airplane has been raised to permit simultaneous maintenance procedures, such as fuel tank leak checks and major component removal. At any weight, the airplane center of gravity must be within the forward and aft limits before you jack.

NOTE: Fuel can be transferred between tanks (or wings) to help control the center of gravity.

CAUTION: MAXIMUM LOAD ON AN AXLE JACK POINT MUST NOT BE EXCEEDED. TO DO SO MAY CAUSE DAMAGE TO THE AIRPLANE.

D. Axle jack points are designed to permit changing two flat tires on the same landing gear while airplane is at maximum taxi weight.
E. Immediately after you jack the airplane to desired height, primary jacks are locked and stabilizer jacks are installed with each preloaded from 16,000 to 24,000 pounds.

NOTE: At the operator's discretion, stabilizing jacks need not be used if there is no wind, airplane gross weight does not exceed 474,000 pounds, CG is within limits, and the number of people on each wing is kept to a minimum with the difference in number on each wing not to exceed 10.

F. For specific jack procedures refer to 07-11-01/201.
G. For specific jack procedures of an asymmetric airplane due to component removal refer to 07-11-07/201.
H. Jack and dejack may be accomplished under wind conditions up to 30 knots. The wing flaps may be in any position for jacking and dejacking.
I. Wingtip jacks must be removed when winds greater than 20 knots are forecast.
J. For wind velocities between 30 and 50 knots, the airplane can be supported using all jacks (except wing tip jacks) provided the airplane is tied down at the wing, nose, and tail jack locations. The airplane cannot be on jacks for wind velocities greater than 50 knots.

# JACK AIRPLANE - MAINTENANCE PRACTICES

1. General
   A. This procedure contains one task. The task is to lift the airplane on jacks.
   B. The system to lift the airplane has three primary jack points and five stabilizing jack points. The primary jack points are at the left and the right wing to body junction (jack points I and II) and at the tail (jack point III). Stabilizing jack points are at the nose (jack point VI), the center of each wing (jack points IV and V), and at each wing tip (jack points VII and VIII).

TASK 07-11-01-582-001

2. Jack Airplane
   A. Special Tools and Equipment
      (1) 8ME65B01202-3 Body Gear Shock Strut Lock Assembly
      (2) 8ME65B01202-3 Wing Gear Shock Strut Lock Assembly
      (3) 6ME65B00161-1 Main Gear Ground Locks (four required)
      (4) 2ME65B01202-1 Nose Gear Ground Lock
      (5) 3OMIT65B00112 Jack Adapter, Outboard Wing
      (6) 36MIT65B00141 Jack Adapter, Forward Body
      (7) 5OMIT65B00112 Jack Adapter, Inboard Wing
   B. Standard Tools and Equipment
      (1) Wing and fuselage jacks
      (2) Axle jacks
      (3) Chocks - Wheel
   C. References
      (1) AMM 08-00-00/201, Leveling and Weighing
      (2) AMM 09-11-00/201, Towing
      (3) AMM 12-15-03/301, Wing Landing Gear Shock Strut
      (4) AMM 12-15-04/301, Body Landing Gear Shock Strut
      (5) AMM 12-15-05/301, Nose Landing Gear Shock Strut
      (6) AMM 32-00-30/201, Landing Gear Door Locks
      (7) AMM 32-09-02/201, Air/Ground Relay System
   D. Access
      (1) Location Zone
          116 Area Between Nose Gear Well and Fuselage, Right (Nose Jack Point)
          314 Stabilizer Torsion Box Compartment, Right (Aft Jack Point)
          191 Fairing, Wing-to-Body, Forward Lower Half, Left (Left Body Jack Point)
          192 Fairing, Wing-to-Body, Forward Lower Half, Right (Right Body Jack Point)

E. Prepare to lift the airplane.

NOTE: You can lift the airplane on jacks with any or all of the doors open.

S 222-002

(1) Make sure the airplane gross weight is to the approved limits (300,000 to 474,000 pounds [136,000 to 215,000 kg]) and that CG location is to the approved limits (14 to 36 percent MAC) (Fig. 201).

S 582-003

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.

(2) Make sure you turn the airplane into the wind if it is possible, when it is out of the hangar.

S 492-032

WARNING: YOU MUST CAREFULLY INSTALL THE GROUND LOCKS IN ALL LANDING GEAR. AN ACCIDENTAL RETRACTION OF THE LANDING GEAR CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

(3) Install the ground locks in all landing gear (Ref 09-11-00/201).

S 492-033

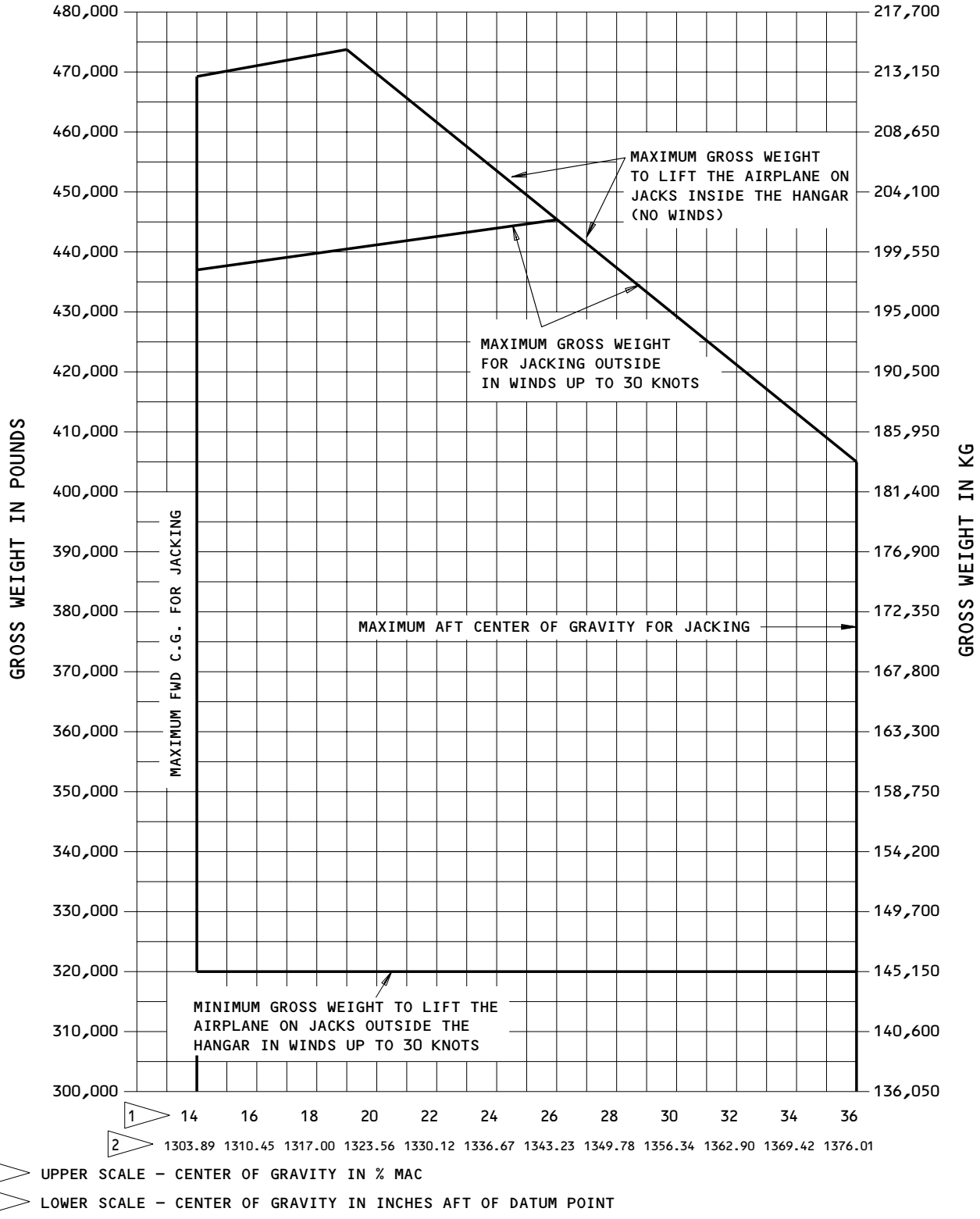
WARNING: YOU MUST CAREFULLY DO THE STEPS IN THE TASKS BELOW TO INSTALL THE DOOR LOCKS ON THE LANDING GEAR DOORS. THE DOORS CAN CLOSE QUICKLY IF YOU DO NOT INSTALL THE DOOR LOCKS CORRECTLY. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

(4) Install the door locks in the main and nose landing gear doors (Ref 32-00-30/201).

S 492-006

CAUTION: DO NOT PERMIT THE AIRPLANE TO MOVE FORWARD OR AFT ON THE JACKS BEFORE THE JACKS ARE SEATED. IF THE AIRPLANE MOVES, IT CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

(5) Make sure the wheel chocks are installed.




1 UPPER SCALE – CENTER OF GRAVITY IN % MAC

2 LOWER SCALE – CENTER OF GRAVITY IN INCHES AFT OF DATUM POINT

Dynamic Airplane Jacking – Maximum Gross Weight Versus Center of Gravity
Figure 201

S 862-028

(6) Make sure the airplane has a level attitude (AMM 08-00-00/201).

S 862-007

CAUTION: THE LANDING GEAR MUST BE FULLY EXTENDED BUT NOT FULLY INFLATED FOR THE RETRACTION TEST. TO PREVENT BAD DAMAGE TO THE SHOCK STRUT, DO NOT LIFT THE WEIGHT OFF WHEELS WITH THE SHOCK STRUTS INFLATED TOO MUCH MORE THAN THE SATISFACTORY PRESSURE.

(7) If you will retract the landing gear, look at the strut extension and pressure and compare it to the gear service chart.
   (a) Adjust the pressure in the strut if it is necessary to get the correct pressure.

S 682-008

(8) Deflate the shock strut of the landing gear.

NOTE: When you lift the airplane on jacks to make the airplane level or to weigh it, or for general maintenance, it is optional to deflate the shock struts.

S 492-009

CAUTION: STRUT MUST BE COMPLETELY DEFLATED AT ALL TIMES WHEN SHOCK STRUT LOCKS ARE INSTALLED. GEAR CANNOT BE RETRACTED SAFELY WHEN SHOCK STRUT LOCKS ARE INSTALLED.

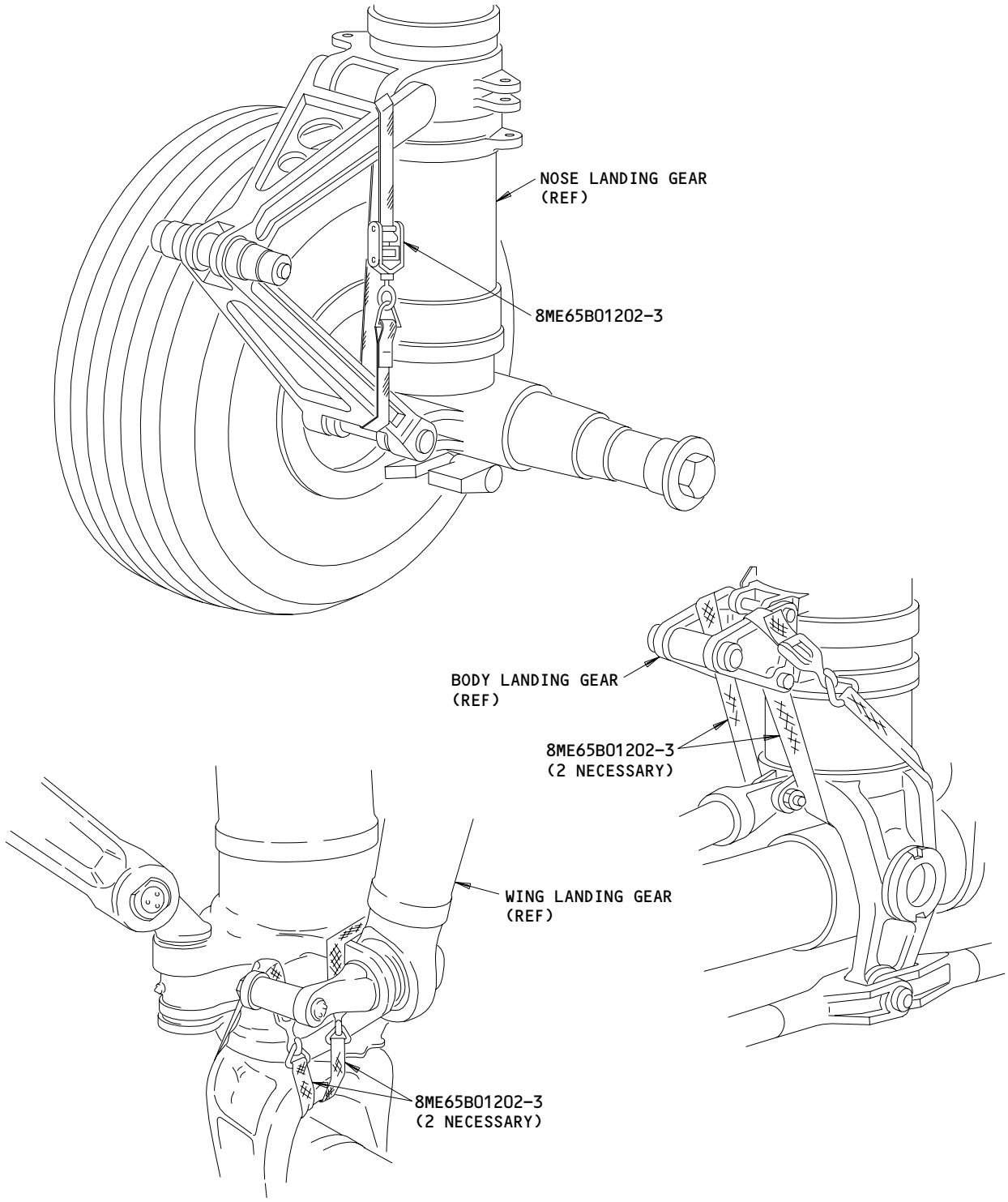
CAUTION: BEFORE YOU DEFLATE THE STRUT MAKE SURE THE AREA BELOW THE WINGS IS CLEAR, OTHERWISE DAMAGE TO THE AIRPLANE AND EQUIPMENT CAN RESULT FROM THE WING DROPPING IN HEIGHT.

(9) Install the shock strut locks.

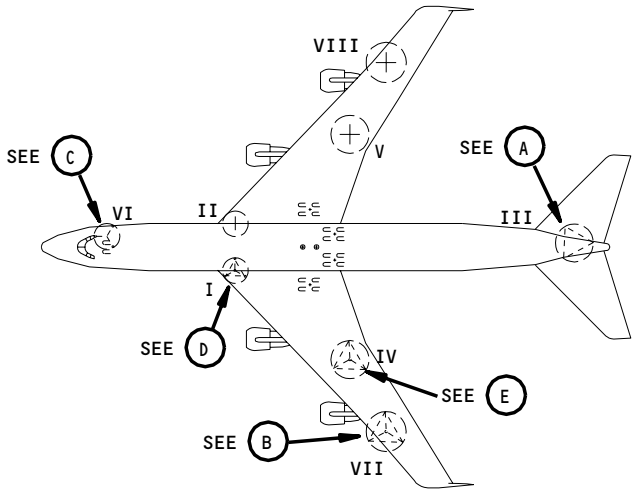
NOTE: When you deflate the shock struts, the height that you have to lift the airplane decreases. Hold the shocks struts in the compressed position with the shock strut locks shown in Fig. 202.

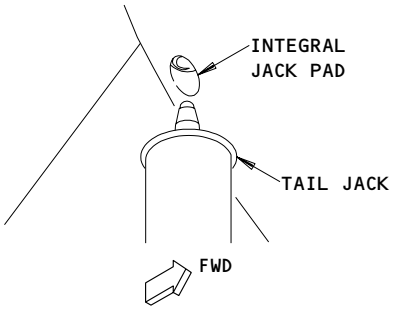
S 012-010

(10) Remove the jack pad covers from the airplane (Fig. 203).



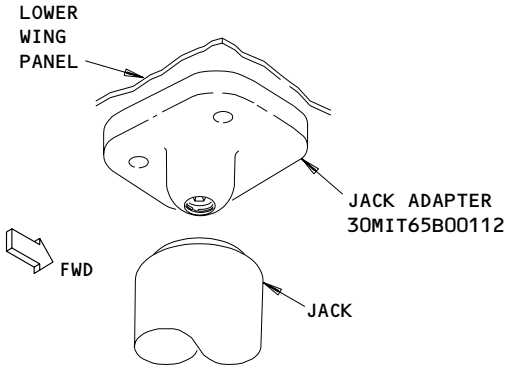

Landing Gear Shock Strut Retention Tool Installation
Figure 202



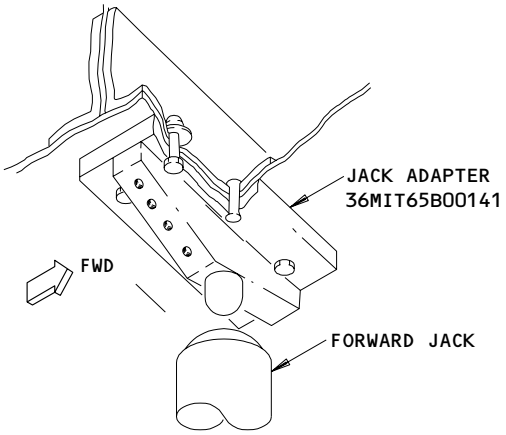

AFT FUSELAGE INTEGRAL JACK PAD (III)

A



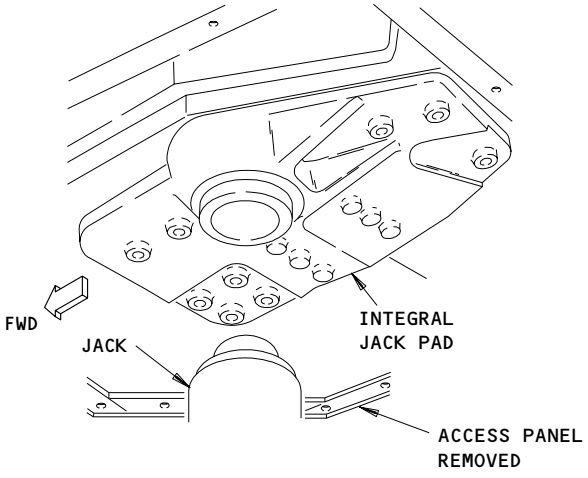

OUTBOARD WING JACK ADAPTER (VII AND VIII)

B



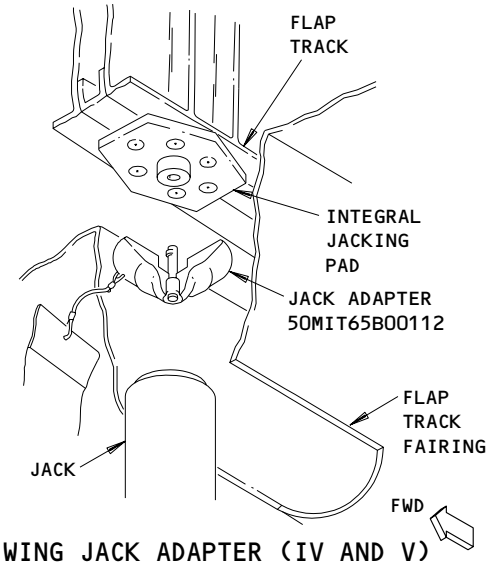

FORWARD BODY (NOSE) JACK ADAPTER (VI)

C




BODY INTEGRAL JACK PAD (I AND II)

D




WING JACK ADAPTER (IV AND V)

E

Jack Pads and Adapters
Figure 203

S 492-011

CAUTION: WHEN YOU INSTALL THE JACK PAD ADAPTERS, USE THE CORRECT ATTACH BOLTS. IF YOU DO NOT USE THE CORRECT BOLTS, YOU CAN CAUSE STRUCTURAL DAMAGE TO THE AIRPLANE.

(11) Install the jack pad adapters for all the jacks you will use (Fig. 203).

S 492-012

(12) Put the jacks in the correct position (Fig. 204).
  (a) Put the primary jacks directly below the jack pads.
  (b) Make sure all the jack pads hold the weight equally.
  (c) Put the caster wheels in an aligned position.

NOTE: With the caster wheels aligned, they can follow one another when the jack turns clockwise (counterclockwise, where applicable).

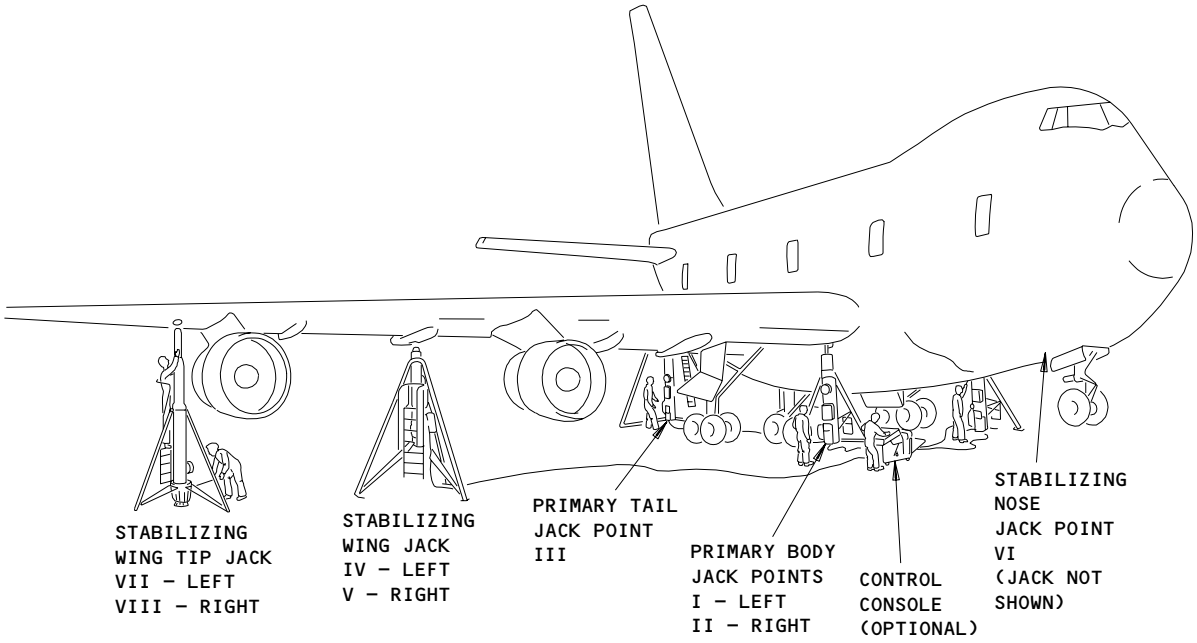
  (d) Make sure the jack is level and the jack cylinder has a vertical attitude.
  (e) Put the wing jacks and the nose jack close to, but not below, the airplane in position for installation when the airplane is to the correct jack height.

CAUTION: DO NOT PERMIT THE JACKSCREW TO EXTEND MORE THAN THE APPROVED EXTENSION ON THE PLACARD. IF YOU EXTEND THE JACKSCREW TOO FAR, YOU CAN CAUSE DAMAGE TO THE JACK AND THE AIRPLANE.

  (f) Turn the inner screw to keep a 3 inch clearance between the jack and the jack pad before you apply pressure to the jack.

S 942-013

(13) Move all the aerostands, ladders, jacks, work platforms, and entry stands out of the area that are not necessary.




| | JACKING POINTS | LOCATION (BODY STA AND BUTTOCK LINE) | MAX STATIC LOAD IN POUNDS (KG) |
|---|---|---|---|
| I | LEFT BODY | STA 993.0<br>WBL 127.5 | 200,000 (90,700) |
| II | RIGHT BODY | STA 993.0<br>WBL 127.5 | 200,000 (90,700) |
| III | TAIL (AFT FUSELAGE) | STA 2596.0<br>RBL 30 | 96,800 (43,900) |
| IV | LEFT WING | STA 1516.0<br>WBL 583 | 30,000 (13,600) |
| V | RIGHT WING | STA 1516.0<br>WBL 583 | 30,000 (13,600) |
| VI | NOSE | STA 400.0<br>RBL 60 | 39,400 (17,800) |
| VII | LEFT OUTBD WING | STA 1681.5<br>WBL 932.6 | 25,000 (11,300) |
| VIII | RIGHT OUTBD WING | STA 1681.5<br>WBL 932.6 | 25,000 (11,300) |

NOTE: RBL = RIGHT BUTTOCK LINE; WBL = WING BUTTOCK LINE

Jack Points Data
Figure 204

S 862-014

WARNING: MAKE SURE THAT YOU PREPARE THE AIRPLANE FOR THE AIR MODE BEFORE YOU LIFT THE AIRPLANE ON JACKS. AUTOMATIC OPERATION OF AIRPLANE SYSTEMS IN THE AIR MODE CAN CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

(14) Do the "Prepare Safety-Sensitive Systems for Air Mode Simulation" task (Ref 32-09-02/201).

F. Lift the Airplane on Jacks.

NOTE: A person must be at each jack and at the plumb bob or inclinometer. A person must be where they can see each jack and this person will coordinate the procedure. Make sure each person can speak to the coordinator through an interphone system.

S 582-015

(1) Lift the airplane on the jacks:
  (a) Put a person at each jack.
  (b) Put a person at the plumb bob in the right wheel well or at the wheel well inclinometer.
  (c) Put a person at the central control console if you will use a control console.
  (d) Supply an interphone to each person at each jack station, plumb bob or inclinometer station, control console operator (when applicable), and coordinator.
  (e) Supply power if it is necessary for the jacking system.

  CAUTION: DO NOT IMMEDIATELY RELEASE THE BRAKES DURING A 10 KNOT WIND OR MORE. STOP UNTIL MOST OF THE AIRPLANE WEIGHT IS ON THE LIFTING JACKS. IF THE AIRPLANE MOVES IT CAN CAUSE DAMAGE TO THE AIRPLANE OR THE JACKS.

  (f) Release the brakes.

(g) Follow the manufacturer's instructions for the jacking system to lift the airplane.

NOTE: You will not put too much load on the primary jacks (two body jacks and the tail jack) if the parameters are not more than the approved limits (i.e., 300,000- to 474,000-pound [136,000- to 215,000-kg] airplane in CG limits and airplane is not more than ±3-degree roll and ±1/2-degree pitch). Refer to Fig. 201 for CG/gross weight limits.

Continuously monitor the jacks for correct vertical attitude and operation. Make sure the airplane stays level when you lift it.

(h) Lift the airplane to the necessary height.

NOTE: If you will do a gear retraction test, lift the airplane until there is a minimum of 4 inches of clearance below the tires. The total tail height in this jack position is 68.08 feet.

S 492-016

(2) When you get to the necessary height, install the wing and nose stabilizing jacks at points IV, V, VI, VII, and VIII as necessary.

S 492-031

(3) Put a load on the stabilizing jacks at points IV, V, VI, VII, and VIII to 16,000 to 24,000 pounds (7200 to 10,800 kg).

G. Lower the Airplane.

S 092-017

(1) Remove the stabilizing jacks.

S 942-018

(2) Move all of the aerostands, ladders, jacks, work platforms, and entry stands out of the area that are not necessary.

S 862-019
(3) Make sure the control lever for the landing gear is in the DN position.

S 492-020
(4) Make sure all ground locks for the landing gear are installed.

S 582-021
(5) Lower the airplane.
(a) Follow the jacking system instructions to lower the airplane.

NOTE: Continuously monitor the jacks for correct operation and to make sure the airplane stays level when you lower it.

S 862-022
(6) Do the "Put the airplane back to the ground mode" task (Ref 32-09-02/201).

H. Put the Airplane to Its Usual Condition.

S 092-023
(1) Remove the power source and put away all power and control equipment.

S 092-024
(2) Make sure the airplane jacks are fully retracted and the jackscrew extensions are in the full down position.

S 862-025

CAUTION: DO NOT PERMIT THE AIRPLANE TO MORE FORWARD OR AFT ON THE JACKS BEFORE THE JACKS ARE SEATED. IF THE AIRPLANE MOVES, IT CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

(3) Make sure the wheel chocks are installed.

S 092-026
(4) Remove the jack pad adapters.

S 412-027
(5) Install the jack pad covers.

S 092-028
(6) Remove the shock strut locks if installed.

S 612-029
(7) Inflate the shock struts if you used the shock strut locks (Ref 12-15-03/301, 12-15-04/301 and 12-15-05/301).

# JACKING AIRPLANE NOSE - MAINTENANCE PRACTICES

1. General
   A. This section gives instructions to lift the airplane nose on jacks. The nose of the airplane can be lifted by one of four different tasks.
      (1) Lift the nose of the airplane by lifting the airplane at the primary wing to body jack points I and II, see Fig. 204.

          NOTE: Use this task when the nose landing gear shock strut must maintain correct servicing, for example: When you want to retract the nose landing gear.

          NOTE: The nose landing gear must be properly serviced prior to retraction.

      (2) To lift the airplane nose at the nose jack point VI (See FIG. 203), use one of the following tasks:

          CAUTION: PUT HYDRAULIC FLUID IN THE STRUT TO EXTEND THE STRUT. DO NOT USE AIR OR NITROGEN BECAUSE TOO MUCH PRESSURE CAN CAUSE DAMAGE TO THE STRUT AT ITS FULL EXTENSION.

          MAKE SURE YOU EXTEND THE NOSE STRUT BEFORE THE AIRPLANE IS LIFTED AT JACK POINT VI. WHEN THE NOSE IS LIFTED INDEPENDENTLY AND SUFFICIENTLY FOR TIRE CLEARANCE, UNUSUAL LOADS ARE CAUSED. JACK POINT VI WILL MOVE IN AN ARC ABOUT 3-1/2 INCHES AFT AND CAUSE LOADS THAT ARE MORE THAN THE DESIGN LIMITS. THE BEND FORCE OF THE JACK RAM IS LESS THAN THE BREAKAWAY FORCE THAT IS NECESSARY TO MOVE THE 16 MAIN LANDING GEAR TIRES. DURING SOME CONDITIONS, JACK DAMAGE AND DAMAGE TO THE AIRPLANE CAN OCCUR. THIS COULD MAKE THE RETRACTION OF THE JACK RAM NOT EASY OR NOT POSSIBLE.

          (a) Lift the nose of the airplane at jack point VI with over filling of the nose shock strut with oil.

              NOTE: To do this task you will deflate the shock strut to within 1 inch of the full extension, then lift the nose at jack point VI.

(b) Lift the airplane nose at jack point VI with deflating the nose landing gear shock strut.

NOTE: To do this task you will deflate the nose landing gear shock strut.

CAUTION: DO NOT USE THE SHOCK STRUT RETENTION TOOL ON INFLATED SHOCK STRUTS. THE RETENTION TOOL HAS A LOAD LIMIT.

(3) An optional method that can be used to perform maintenance on the nose landing gear and reduce the over all jacking height to acheive nose wheel clearance is to lift the airplane nose and use the retention tool for the shock strut and the body jacks at jack points I and II. The nose can also be lifted with the retention tool and the nose jack at jack point VI.

NOTE: Do this with a deflated shock strut.

NOTE: Do not install the retention tool when the nose landing gear is going to be retracted.

(4) Lift the nose of the airplane with axle jacks.

NOTE: Use this task when you will not move the nose landing gear, for example: removal and installation of the wheel and tire assembly.

(5) When the airplane can not be lifted on jacks at jack points I and II, the nose strut must be extended to lift the airplane at jack point VI. Put hydraulic fluid in the nose shock strut until the strut is within 1 inch of its full extension. Put the jack at jack point VI and lift the jack until you get the recommended tire clearance.

(6) A nose axle jack or an incline block can be used to do a wheel or tire change (AMM 07-11-03/201).

TASK 07-11-02-582-001

2. Lift the Airplane Nose On Jacks

A. Special Tools and Equipment
   (1) 6ME65B00161-1 Main Gear Ground Lock (4 required)
   (2) 2ME65B01202-1 Nose Gear Ground Lock
   (3) 8ME65B01202-3 Landing Gear Shock Strut Retention Tool
   (4) 11MIT65B04012 Nose Landing Gear Door Lock

B. Standard Tools and Equipment
   (1) Equipment - Jacking
   (2) Pressure Gage - 0-3000 psi (accuracy of ± 2-1/2%, graduations not more than 100 psi apart, diameter not less than 4 inches)

C. References
   (1) 07-11-00/001, Lifting Airplane for Maintenance

(2) 07-11-01/201, Jacking Airplane
(3) 09-11-00/201, Towing
(4) 12-15-05/301, Nose Landing Gear Shock Strut
(5) 32-00-30/201, Landing Gear Door Locks
(6) 32-51-00/501, Nose Wheel Steering System

D. Access

(1) Location Zones

191 Fairing Wing-To-Body Forward Lower Half, LH (Left Body Jack Point)
192 Fairing Wing-To-Body Forward Lower Half, RH (Right Body Jack Point)
116 Area Between Nose Gear Well and Fuselage, RH (Nose Jack Point)
715 Nose Landing Gear - Shock Strut

E. Prepare to Lift the Airplane on Jacks

S 862-002

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.

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

S 492-003

WARNING: USE THE PROCEDURE IN 32-00-30/201 TO INSTALL THE DOOR LOCKS. THE DOORS OPEN AND CLOSE QUICKLY AND CAN CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

(2) Open the doors for the nose landing gear and install the door locks (AMM 32-00-30/201).

S 492-026

(3) Make sure the downlocks are installed on the nose and main landing gear (AMM 09-11-00/201).

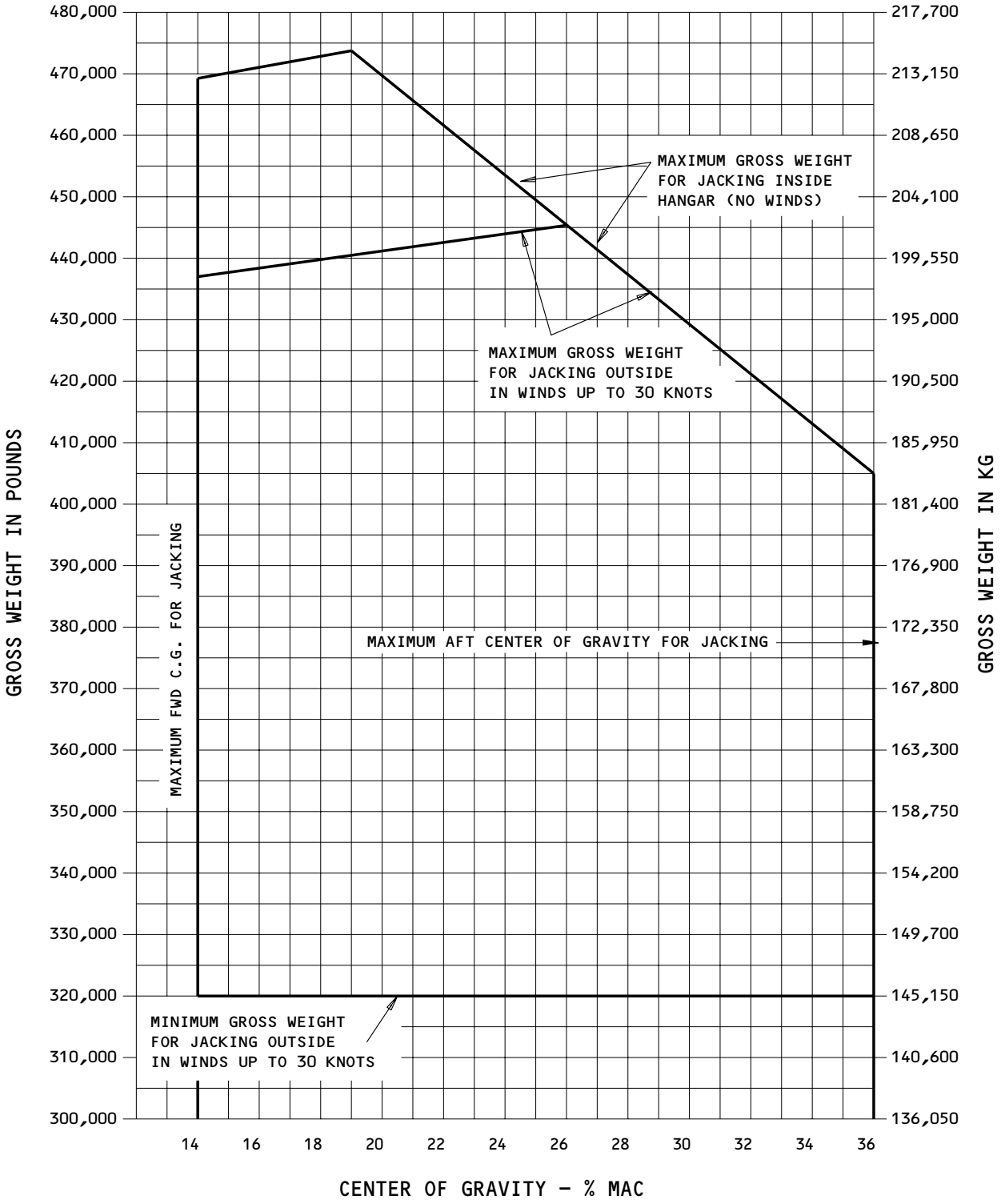
S 972-004

(4) Make sure the airplane gross weight and center of gravity (CG) are at the approved limits.

NOTE: You can move the airplane fuel load or cargo load to make sure the jack point loads are at the approved limits.

(a) The approved limits when you use the main jacks are found in Fig. 201.
(b) The approved limits when you use the nose jacks are found in Fig. 202.

F. Lift the Airplane Nose with the Main Jacks I and II



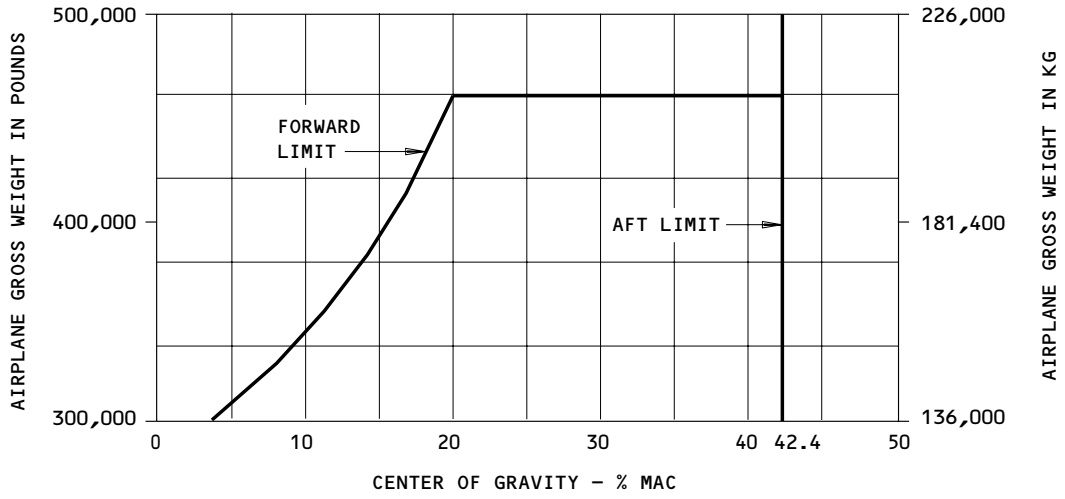

Dynamic Airplane Jacking-Maximum Gross Weight Versus C.G.
Figure 201

S 612-031

CAUTION: MAKE SURE THE NOSE LANDING GEAR IS PROPERLY SERVICED BEFORE YOU PROCEED WITH THE STEPS IN THIS JACKING PROCE DURE. FAILURE TO SERVICE THE NOSE LANDING GEAR CAN CAUSE DAMAGE TO THE AIRPLANE AND EQUIPMENT.

(1) Do the servicing of the shock strut on the nose landing gear (AMM 12-15-05/301).

NOTE: Do not do this step if the shock strut retention tool is going to be used.




NOTE: 1. NOSE GEAR FULL EXTENDED WITH 1 - INCH TIRE CLEARANCE
2. AIRPLANE ON LEVEL RAMP
3. JACK POINT REACTION LIMITED TO 39,400 LBS (17,800 KG)

Nose Jackpoint Weight/CG. Limitations
Figure 202

S 862-028

(2) An optional method that can be used to perform maintenance on the nose landing gear and reduce the over all jacking height to acheive nose wheel clearance is to lift the airplane nose and use the retention tool for the shock strut and the body jacks at jack points I and II.

NOTE: Do this with a deflated shock strut.

NOTE: Do not install the retention tool when the nose landing gear is going to be retracted.

WARNING: DO NOT RETRACT THE NOSE LANDING GEAR WITH THE SHOCK STRUT RETENTION TOOL INSTALLED. RETRACTING THE NOSE LANDING GEAR WITH THE SHOCK STRUT RETENTION TOOL INSTALLED CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

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.

(a) When you lift the airplane and use the shock strut retention tool, deflate the nose gear (AMM 12-15-05/301).

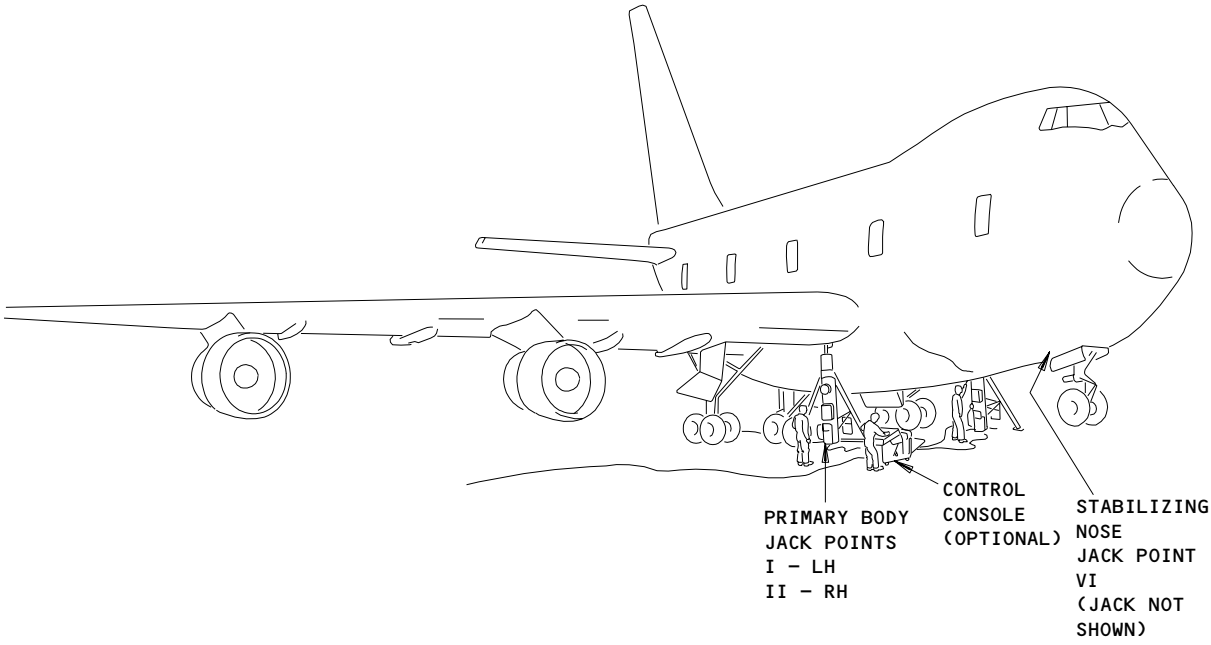
CAUTION: DO NOT USE THE SHOCK STRUT RETENTION TOOL ON INFLATED SHOCK STRUTS. THE RETENTION TOOL HAS A LOAD LIMIT.

(b) Install the shock strut retention tool on the nose landing gear.

S 862-029

(3) To lift the airplane nose, do the steps that follow.

(a) Remove the jack pad covers from the main jack pad locations I and II (Fig. 203).




| | JACKING POINTS | LOCATION (BODY STA AND BUTTOCK LINE) | MAX STATIC LOAD IN POUNDS (KG) |
|---|---|---|---|
| I | LEFT BODY | STA 993.0<br>WBL 127.5 | 200,000 (90,700) |
| II | RIGHT BODY | STA 993.0<br>WBL 127.5 | 200,000 (90,700) |
| VI | NOSE | STA 400.0<br>RBL 60 | 39,400 (17,800) |

NOTE: RBL = RIGHT BUTTOCK LINE; WBL = WING BUTTOCK LINE.

Jacking Points Data
Figure 203

(b) Put the jacks directly below the jack pads at jack points I and II.
(c) Turn the jacks until the line between two outboard footpads is parallel to the airplane centerline (Fig. 204).
(d) Make sure the jack is level and in the center of the jack adapter.
(e) Make sure the area below the airplane is clear of all equipment that is not necessary.
(f) Put one person at each jack.

NOTE: Make sure all persons talk to the coordinator on the interphone.

(g) Release the airplane brakes.
(h) Move the forward wheel chocks at the main gear, forward of the tires about 3-1/2 inches from tires.
(i) Connect the power to the jack system.
(j) Operate the jacks to set the jack in the jack adapters. Refer to the jack manufacturers' instructions and lift the airplane until the nose gear wheels are clear of the ground.

NOTE: When it is available, a nose jack can be put in position and preloaded to 8000 pounds (3600 kg) to make the airplane more stable.

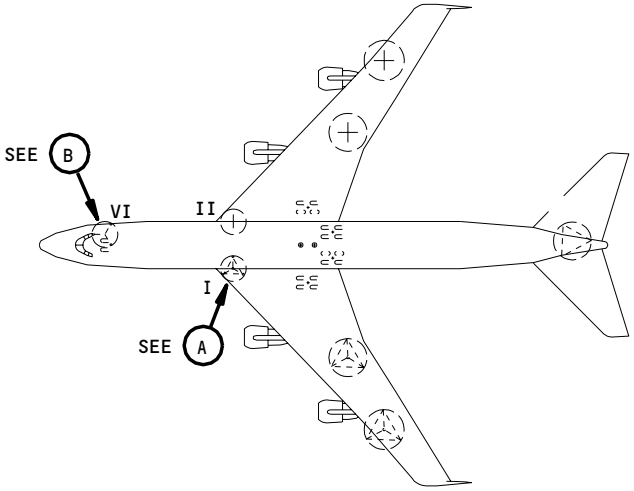
1) Make sure the jack rams are locked before maintenance is done on the airplane.

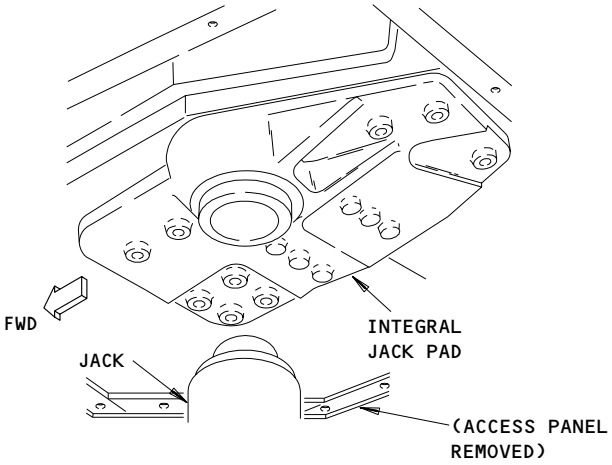
S 582-008

(4) Lower the airplane off the jacks.
(a) Make sure the area below the airplane is clear.
(b) If the nose jack was used, lower and remove nose jack before the main jacks are lowered.
(c) Lower the main jacks. Refer to the jack manufacturers' instructions.

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

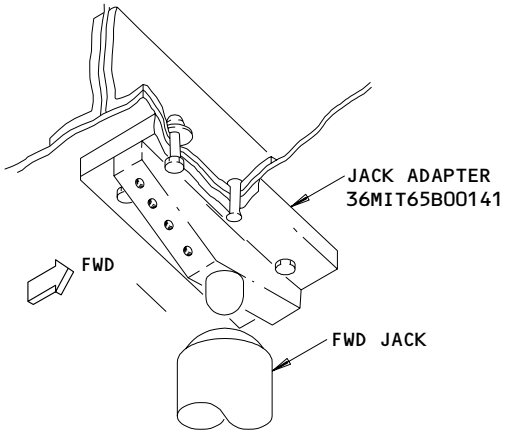
(d) Move the jacks away from the airplane.
(e) Install the jack pad covers.




BODY INTEGRAL JACK PAD (I & II)

A




FORWARD BODY (NOSE) JACK ADAPTER (VI)

B

Jacking Points
Figure 204

(f) Remove the optional nose landing gear shock strut retention tool if it was installed.

S 612-010

(5) Do the servicing of the shock strut on the nose landing gear (AMM 12-15-05/301).

G. Extend the Nose Shock Strut and Lift the Airplane Nose at Jack Point VI.

S 862-011

(1) Put the nose landing gear in the center position (AMM 32-51-00/501).

S 862-024

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 12-15-05/301).

S 862-030

CAUTION: PUT HYDRAULIC FLUID IN THE STRUT TO EXTEND THE STRUT. DO NOT USE AIR OR NITROGEN BECAUSE TOO MUCH PRESSURE CAN CAUSE DAMAGE TO THE STRUT AT ITS FULL EXTENSION.

MAKE SURE YOU EXTEND THE NOSE STRUT BEFORE THE AIRPLANE IS LIFTED AT JACK POINT VI. WHEN THE NOSE IS LIFTED INDEPENDENTLY AND SUFFICIENTLY FOR TIRE CLEARANCE, UNUSUAL LOADS ARE CAUSED. JACK POINT VI WILL MOVE IN AN ARC ABOUT 3-1/2 INCHES AFT AND CAUSE LOADS THAT ARE MORE THAN THE DESIGN LIMITS. THE BEND FORCE OF THE JACK RAM IS LESS THAN THE BREAKAWAY FORCE THAT IS NECESSARY TO MOVE THE 16 MAIN LANDING GEAR TIRES. DURING SOME CONDITIONS, JACK DAMAGE AND DAMAGE TO THE AIRPLANE CAN OCCUR. THIS COULD MAKE THE RETRACTION OF THE JACK RAM NOT EASY OR NOT POSSIBLE.

(3) To inflate the shock strut of the nose landing gear with the correct servicing fluid, do the steps that follow (AMM 12-15-05/301):
(a) Connect a 0-3000 psi pressure gage to the air charging 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 24.5 INCHES. IF THE "A" DIMENSION IS MORE THAN 24.5 INCHES, DAMAGE TO THE SEALS CAN OCCUR.

(b) Put the correct servicing fluid into the strut with a pump. Do this until it is extended to a dimension "A" of 23.5 to 24.5 inches.
(c) Close the air charge valve and remove the pressure gage.

S 582-013

(4) Lift the airplane nose to the necessary height.
(a) Remove the attach point screws of the jack adapter at jack point VI (Fig. 203).
(b) Install the jack adapter (Fig. 204).

CAUTION: MAKE SURE THE JACK IS IN THE CENTER, BELOW THE JACK ADAPTER. IF THE JACK IS NOT IN THE CENTER, BELOW THE JACK ADAPTER, DAMAGE TO THE JACK OR THE AIRPLANE CAN OCCUR.

(c) Put the jack directly below the jack adapter at jack points VI. Turn the jack until a line between the aft two jack footpads is vertical to the airplane centerline. Make sure the jack is in the center below the jack adapter.
(d) Release the parking brake.
(e) Move the forward wheel chocks at the main gear, forward of the tires about 3-1/2 inches from tires.

CAUTION: DO NOT LIFT THE NOSE OF THE AIRPLANE 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 nose to the necessary height, but not more than 6 inches.

(g) Apply the parking brake when the airplane is at the necessary height.
(h) Make sure the jack ram is locked before maintenance is done on the airplane.

S 582-015
(5) Lower the airplane nose off 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 control lever for the landing gear is in the DN position.
(c) Lower the jack until the jack is at the bottom or until the airplane weight is on the nose gear.
(d) Move the jack away from the airplane.
(e) Remove the jack adapter (Fig. 204).
1) Install the attach point screws for the jack adapter in the airplane structure.

S 612-016
(6) Deflate and do the servicing of the shock strut (AMM 12-15-05/301).

H. Lift the Airplane Nose at Jack Point VI with deflating the Nose Shock Strut.

S 862-032
(1) Deflate the shock strut of the nose landing gear (AMM 12-15-05/301).

S 862-018

CAUTION: DO NOT USE THE SHOCK STRUT RETENTION TOOL ON INFLATED SHOCK STRUTS. THE RETENTION TOOL HAS A LOAD LIMIT.

(2) An optional method that can be used to perform maintenance on the nose landing gear and reduce the over all jacking height to acheive nose wheel clearance is to lift the airplane nose and use the retention tool for the shock strut and the jack point VI.

NOTE: Do this with a deflated shock strut.

NOTE: Do not install the retention tool when the nose landing gear is going to be retracted.

(a) Install the retention tool.

S 582-020

(3) To lift the airplane nose, do the steps that follow:
  (a) Remove the attach point screws of the jack adapter at jack point VI (Fig. 203).
  (b) Install the jack adapter (Fig. 204).

  CAUTION: MAKE SURE THE JACK IS IN THE CENTER BELOW THE JACK ADAPTER. IF THE JACK IS NOT IN THE CENTER BELOW THE JACK ADAPTER, DAMAGE TO THE JACK OR THE AIRPLANE CAN OCCUR.

  (c) Put the jack directly below the jack adapter at jack points VI. Turn the jack so that a line between aft two jack footpads is vertical to the airplane centerline. Make sure the jack is in the center below the jack adapter.

  CAUTION: DO NOT LIFT THE NOSE OF THE AIRPLANE 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.

  (d) Lift the nose to the necessary height, but not more than 6 inches.
  (e) Make sure the jack ram is locked before maintenance is done to the airplane.

S 582-021

(4) Lower the airplane nose off the jack. Do the steps that follow:
  (a) Make sure the area below the airplane is clear.
  (b) Make sure the control lever for the landing gear is in the DN position.
  (c) Lower the jack until the jack is at the bottom or until the airplane weight is on the nose gear.
  (d) Move the jack away from the airplane.
  (e) Remove the jack adapter (Fig. 204).
  (f) Install the attach point screws for the jack adapter in the airplane structure.
  (g) Remove the optional retention tool for if it was installed on the shock strut.

S 612-022

(5) Do the servicing of the shock strut on the nose landing gear (AMM 12-15-05/301).

## JACK AIRPLANE AXLES - MAINTENANCE PRACTICES

1. General
   A. This procedure contains one task. The task is to lift the airplane axles with jacks.
   B. There are jack points on the truck beam below each landing gear axle. You can use these to remove a wheel and tire or brake assemblies without lifting the airplane. For approximate heights of the axle jack pads and clearances between the tires, see Fig. 201.
   C. You must lift the axle to permit the use of the axle jacks if there are conditions that are not normal. An example of non normal conditions are as follows:
      (1) The two tires on the same axle are flat, and the height of the axle jack point is decreased to where normal axle jacks are too high.

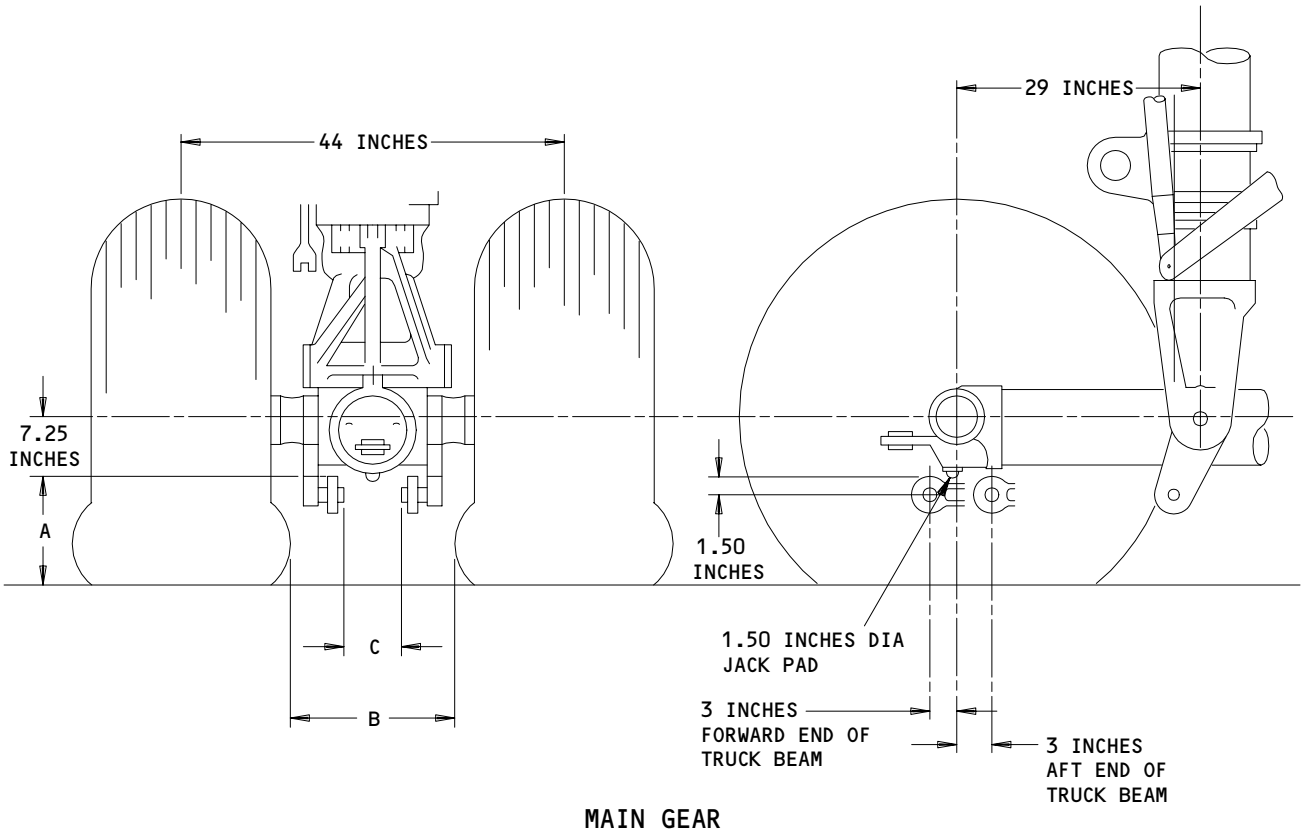
TASK 07-11-03-582-023

2. Lift Airplane Axles (Fig. 201)
   A. General

WARNING: TRUCKS CAN SCRUB AROUND WHEN YOU TOW OR TAXI AN AIRPLANE IN A TURN. THEREFORE, IF A TRUCK IS LIFTED WHEN THE AIRPLANE IS STOPPED DURING A TURN, THE GEAR WILL TEND TO UNTWIST. THE JACK CAN FAIL WHEN LARGE SIDE LOADS ARE GENERATED. IF YOU THINK THERE ARE SIDE LOADS, MOVE THE AIRPLANE STRAIGHT FORWARD OR AFT A MINIMUM OF 10 FEET TO REMOVE THE LOADS.

CAUTION: DO NOT LIFT THE AIRPLANE OR THE GEAR ASSEMBLY WITH A JACK BELOW A PART OF THE TRUCK OTHER THAN THE AXLE JACK PADS. YOU CAN CAUSE TRUCK FAILURE IF THERE IS DAMAGE FROM THE JACK.

INSTALL CHOCKS ON THE WHEELS THAT ARE NOT JACKED AND RELEASE THE BRAKES BEFORE YOU LIFT OR LOWER THE AXLE. THE TRUCK BEAM MUST BE FREE TO TURN RELATIVE TO THE WHEELS WHICH STAY ON THE GROUND.




MAIN GEAR

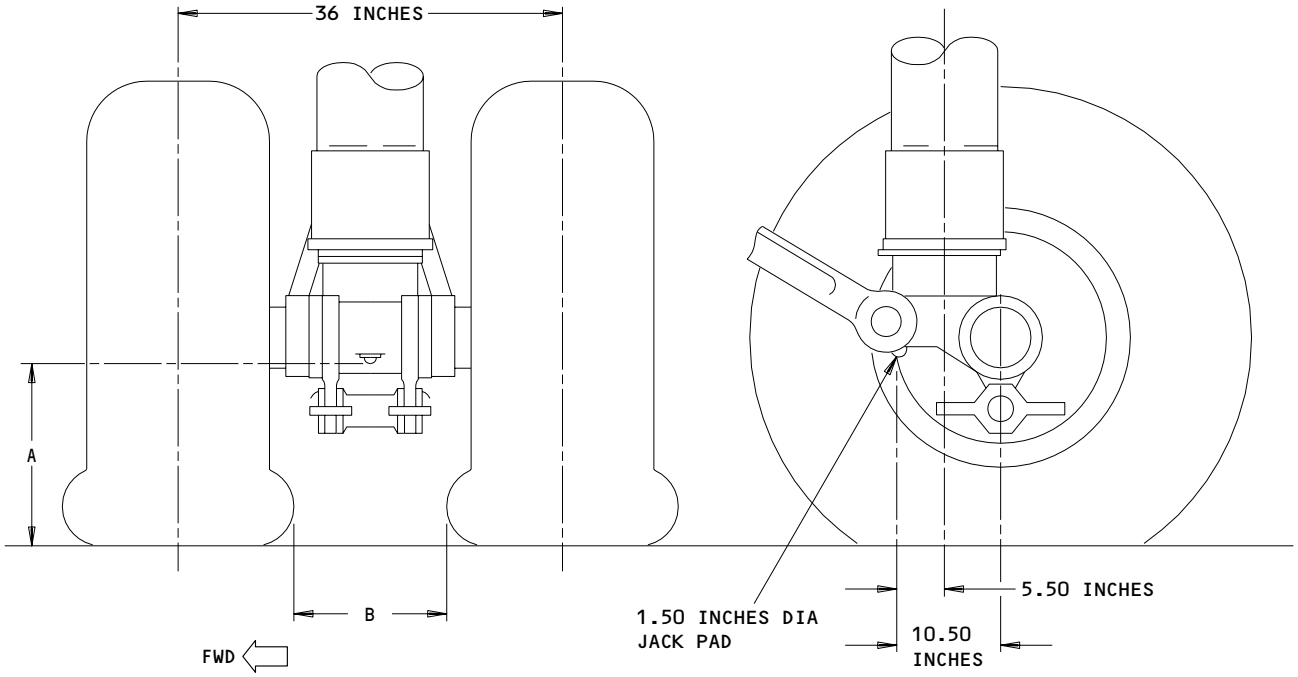
| CONDITION | 49 X 17 TIRE | | | 49 X 19 TIRE | | |
|---|---|---|---|---|---|---|
| | A (INCHES) | B (INCHES) | C (INCHES) | A (INCHES) | B (INCHES) | C (INCHES) |
| AIRPLANE AT MAX TAXI WEIGHT TIRES NORMALLY INFLATED | 12.5 | 23.5 | 9.0 [1] / 8.6 [2] | 12.5 | 21.5 | 9.0 [1] / 8.6 [2] |
| AIRPLANE AT MAX TAXI WEIGHT BOTH TIRES FLAT | 7.0 | 20.0 | 9.0 [1] / 8.6 [2] | 7.5 | 18.5 | 9.0 [1] / 8.6 [2] |
| AIRPLANE AT MAX TAXI WEIGHT ON WHEEL RIMS | 4.5 | 27.0 | 9.0 [1] / 8.6 [2] | 4.5 | 27.0 | 9.0 [1] / 8.6 [2] |
| AIRPLANE ON JACKS - HIGH ENOUGH FOR TIRE CHANGE | 20.0 | 26.0 | 9.0 [1] / 8.6 [2] | 20.5 | 24.0 | 9.0 [1] / 8.6 [2] |

[1] IF BOLT HEADS FACE EACH OTHER

[2] IF BOLTS TURNED UNTIL BOTH HEADS FACE AWAY FROM TRUCK CENTERLINE

NOTE: THE DIMENSIONS GIVEN IN THE TABLE ABOVE ARE APPROXIMATE AND WILL BE DIFFERENT ON DIFFERENT TIRE TYPES AND CONDITIONS.

Jack Pad Locations - Axle Jacking
Figure 201 (Sheet 1)




NOSE GEAR

| CONDITION | 49 X 17 TIRE | | 49 X 19-20 TIRE | |
|---|---|---|---|---|
| | A (INCHES) | B (INCHES) | A (INCHES) | B (INCHES) |
| AIRPLANE AT MAX TAXI WEIGHT TIRES NORMALLY INFLATED | 20.0 | 16.0 | 20.0 | 13.5 |
| AIRPLANE AT MAX TAXI WEIGHT BOTH TIRES FLAT | 13.5 | 13.0 | 14.0 | 10.5 |
| AIRPLANE AT MAX TAXI WEIGHT ON WHEEL RIMS | 10.5 | 19.0 | 10.5 | 19.0 |
| AIRPLANE ON JACKS - HIGH ENOUGH FOR TIRE CHANGE | 26.0 | 18.0 | 26.5 | 16.0 |

NOTE: THE DIMENSIONS GIVEN IN THE TABLE ABOVE ARE APPROXIMATE AND WILL BE DIFFERENT ON DIFFERENT TIRE TYPES AND CONDITIONS.

Jack Pad Locations - Axle Jacking
Figure 201 (Sheet 2)

(1) Obey these warnings and cautions during all of this task.

B. Special Tools and Equipment
(1) 8ME65B01202-3 Landing Gear Shock Strut Retention Tool
(2) 6ME65B00161-1 Main Gear Ground Locks (4 required)
(3) 2ME65B01202-1 Nose Gear Ground Lock
(4) MIT65B18229 MLG Auxiliary Jacking Bar
(5) 3MIT65B00162 Nose Gear Steering Lock Assembly (for use on airplanes with steering piston rod of 2.24-inch diameter)
(6) MIT65B01562 Nose Gear Steering Lock Assembly (for use on airplanes with steering piston rod of 2.37-inch diameter)
(7) 2MIT65B04011-41 Steering Lockout Pin

C. Standard Tools and Equipment
(1) Adapters - Axle
(2) Adapters - Jacking
(3) Block - Inclined

D. References
(1) 09-11-00/201, Towing
(2) 12-15-06/301, Landing Gear Tire
(3) 32-00-30/201, Landing Gear Door Locks
(4) 32-41-09/401, Hydraulic Brake Accumulator

E. Access
(1) Location Zone
715 Nose Landing Gear
735 Wing Landing Gear, Left
745 Wing Landing Gear, Right
755 Body Landing Gear, Left
765 Body Landing Gear, Right

F. Prepare to Lift the Airplane on Jacks.

S 492-021

WARNING: YOU MUST CAREFULLY INSTALL THE GROUND LOCKS IN ALL LANDING GEAR. AN ACCIDENTAL RETRACTION OF THE LANDING GEAR CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

(1) Install the ground locks in all landing gear (Ref 09-11-00/201).

S 492-022

WARNING: YOU MUST CAREFULLY DO THE STEPS IN THE TASKS BELOW TO INSTALL THE DOOR LOCKS ON THE LANDING GEAR DOORS. THE DOORS CAN CLOSE QUICKLY IF YOU DO NOT INSTALL THE DOOR LOCKS CORRECTLY. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

(2) Install the door locks in the main landing gear and the nose landing gear doors (Ref 32-00-30/201).

G. Lift the Main Landing Gear Axles (Normal Tire Conditions)

S 492-003

(1) Put the jack directly below the jack pad of the applicable gear truck.

NOTE: You can use the axle jacks below one axle, below the two axles of a gear, or below all axles of all gears. See Fig. 202 for limits to lift the airplane in windy conditions.

S 862-004

CAUTION: THE LANDING GEAR STRUTS MUST BE CORRECTLY SERVICED TO PREVENT DAMAGE TO THE AIRPLANE STRUCTURE. WHEN YOU LIFT THE AIRPLANE, DO NOT LIFT A MAIN GEAR AXLE MORE THAN NECESSARY TO SUPPLY 2 INCHES OF TIRE CLEARANCE FOR A FULLY INFLATED TIRE.

(2) Make sure the shock struts are inflated.

S 492-005

(3) Install the wheel chocks at the inflated tires of the truck that is not being lifted with the jack.

NOTE: Make sure you have a set of wheel chocks on a set of landing gear tires on the right side and the left side of the airplane. If both trucks on one side of the airplane are lifted with axle jacks, put wheel chocks at the nose gear tires.

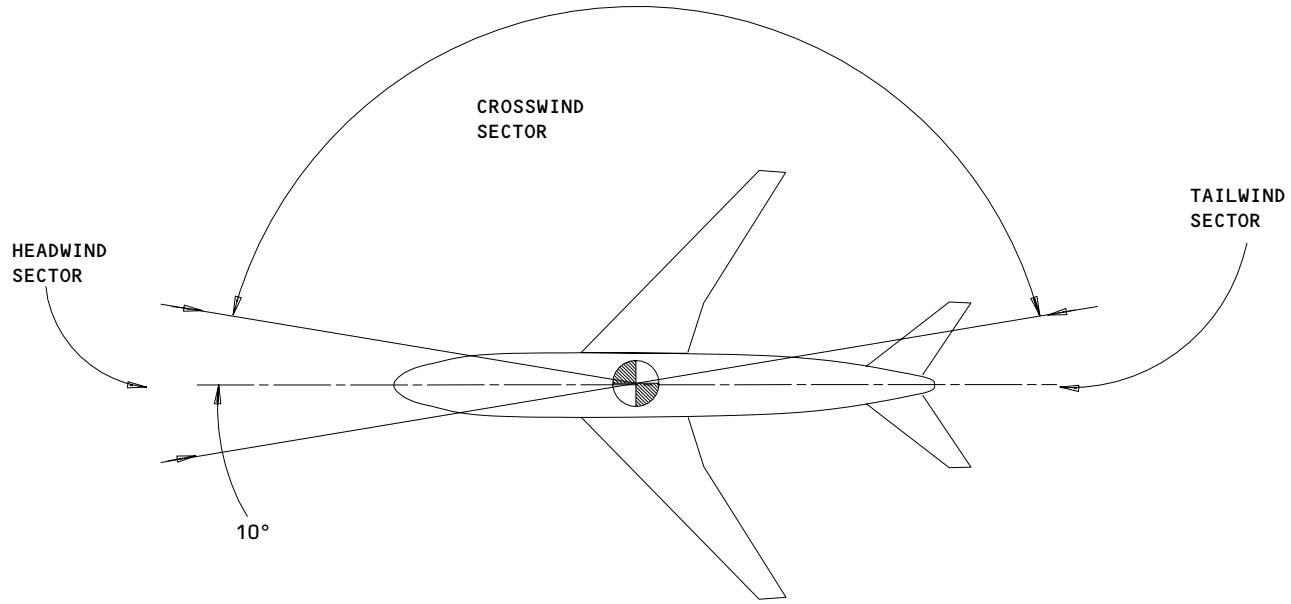
S 862-006

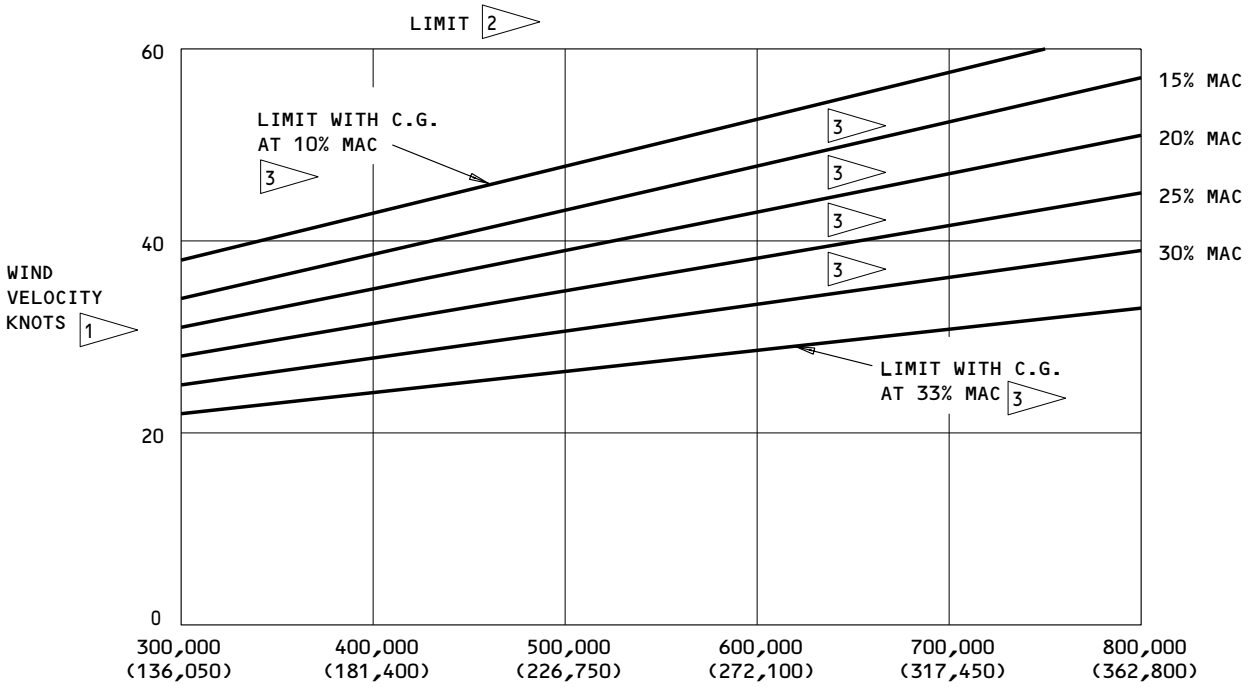
(4) Release the brakes.

S 862-007

CAUTION: DO NOT PERMIT THE LOAD ON A JACK OR JACK PAD TO BE MORE THAN THE APPROVED LIMITS.

(5) Follow the jack system manufacturer's instructions on the jack placard, to lift the jack.



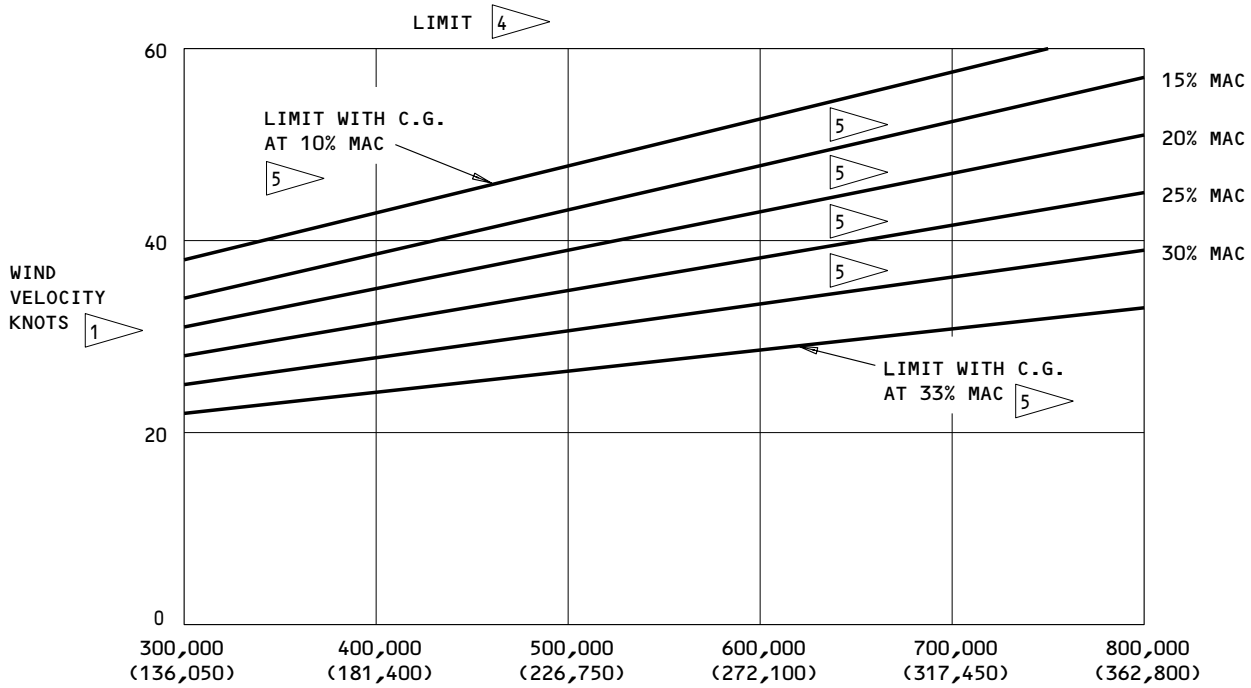

1 DECREASE BY 1/3 FOR OPERATIONS NEAR BUILDINGS OR LARGE AIRCRAFT. FOR GUSTY CONDITIONS, USE GUST VELOCITY.

2 HEAD OR TAIL WIND: ALL CONDITIONS; CROSSWIND: DRY CONDITIONS

3 CROSSWIND: WET AND ICY CONDITIONS

MAIN GEAR

Jack Airplane Axles In Windy Conditions
Figure 202 (Sheet 1)




1 DECREASE BY 1/3 FOR OPERATIONS NEAR BUILDINGS OR LARGE AIRCRAFT. FOR GUSTY CONDITIONS, USE GUST VELOCITY.

4 HEAD OR TAIL WIND: DRY, WET, OR ICY CONDITIONS

5 CROSSWIND: DRY, WET, OR ICY CONDITIONS

6 CAUTION: ABOVE 30 KNOTS, DIMENSION "A" ON STRUT SERVICING CHART (LOCATED IN NOSE WHEEL WELL) MUST NOT BE MORE THAN 5.0 INCHES. DEFLATE IF NECESSARY (REF 12-15-05/201) AND REINFLATE AFTER YOU LIFT THE AIRPLANE ON JACKS.

NOSE GEAR 6

Jack Airplane Axles In Windy Conditions
Figure 202 (Sheet 2)

H. Lift the Main Landing Gear Axles (Unusual Conditions - One or More Flat Tires)

S 612-008

WARNING: ALWAYS USE A PRESSURE REGULATOR ON A HIGH PRESSURE AIR SOURCE WHEN YOU INFLATE DAMAGED TIRES. BE CAREFUL NOT TO INFLATE THE TIRES MORE THAN THE STRUCTURAL LIMITS.

CAUTION: IF THERE IS MULTIPLE TIRE FAILURE ON MORE THAN ONE MAIN GEAR ON THE SAME SIDE OF THE AIRPLANE, LIFT THE AXLES AT THE TWO GEARS AT THE SAME TIME, AND KEEP EVEN JACK LOADS. IF EQUIPMENT IS NOT AVAILABLE OR YOU CAN LIFT THE AXLES AT ONE GEAR ONLY, ALWAYS LIFT THE WING (OUTBOARD) GEAR AXLES AND FIX THE TIRES BEFORE BEFORE YOU LIFT THE BODY (INBOARD) GEAR AXLES, TO MINIMIZE THE POSSIBILITY OF STRUT OVERLOAD.

(1) Inflate the tire(s) to the necessary pressure (Ref 12-15-06/301).

S 582-009

(2) Lift the axle if you can inflate one tire to a sufficient height to put the axle jack in the correct position.
  (a) Put the jack directly below the jack pad of the applicable gear truck.

NOTE: If one tire is flat on each axle of a gear, it is recommended that you use a jack below each axle. If only one jack is available, use cribbing below one axle while you lift the other axle. This is to prevent too much load on the tire on the axle that you will not lift, and will decrease the risk of tire failure. If two tires on one axle and one tire on other axle of a gear are flat, always replace the tire on the axle with one flat tire before you replace the tires on the other axle. Limits to lift the airplane in windy conditions are found on Fig. 202.

CAUTION: YOU MUST LIFT THE AIRPLANE WITH THE SHOCK STRUT INFLATED.

  (b) Make sure the shock struts are inflated.
  (c) Install the wheel chocks at the inflated tires of the truck that is not being lifted with the jack.

NOTE: Make sure you have a set of wheel chocks at a set of landing gear tires on the right side and the left side of the airplane. If both trucks on one side of the airplane are lifted with axle jacks, put wheel chocks at the nose gear tires.

  (d) Release the brakes.

S 862-010

WARNING: WHEN YOU LIFT AN AXLE ON THE MAIN GEAR, DO NOT PUT A LOAD ON THE JACK MORE THAN 85,000 POUNDS (38,500 KG) IF THE AXLE OPPOSITE THE ONE YOU WILL LIFT HAS ONLY ONE INFLATED TIRE AND THE AXLE IS NOT HELD. IF YOU DO NOT OBEY THIS CAUTION, THE TIRE CAN FAIL BECAUSE OF TOO MUCH LOAD.

(3) Lift the jack.

NOTE: Use the jack system manufacturer's instructions on the jack placard.

S 862-011

CAUTION: WHEN YOU USE AN INCLINED BLOCK, IT IS NECESSARY THAT ALL GEAR STRUT ARE CORRECTLY SERVICED AND THE TIRES THAT REMAIN ARE SERVICEABLE, AND THE AIRPLANE MGTW IS 450,000 POUNDS (204,000 KG) OR LESS. THERE ARE LIMITS WHEN YOU USE THE INCLINED BLOCKS BECAUSE OF TIRE OVERLOAD, NOT BECAUSE OF AIRPLANE STRUCTURAL LIMITS.

(4) If you cannot use jacks or they are not available, push or tow the airplane until the main gear moves up an inclined block (Fig. 203) on serviceable tires only (Ref 09-11-00/201).

NOTE: A 7 1/2-inch high block will supply approximately 1-inch tire clearance on the wing or the body gear.

S 012-024

CAUTION: YOU MUST USE AUXILIARY JACKING BARS IN PAIRS. IF YOU JACK THE AXLE WITH A SINGLE JACKING BAR, DAMAGE TO THE AXLE CAN OCCUR.

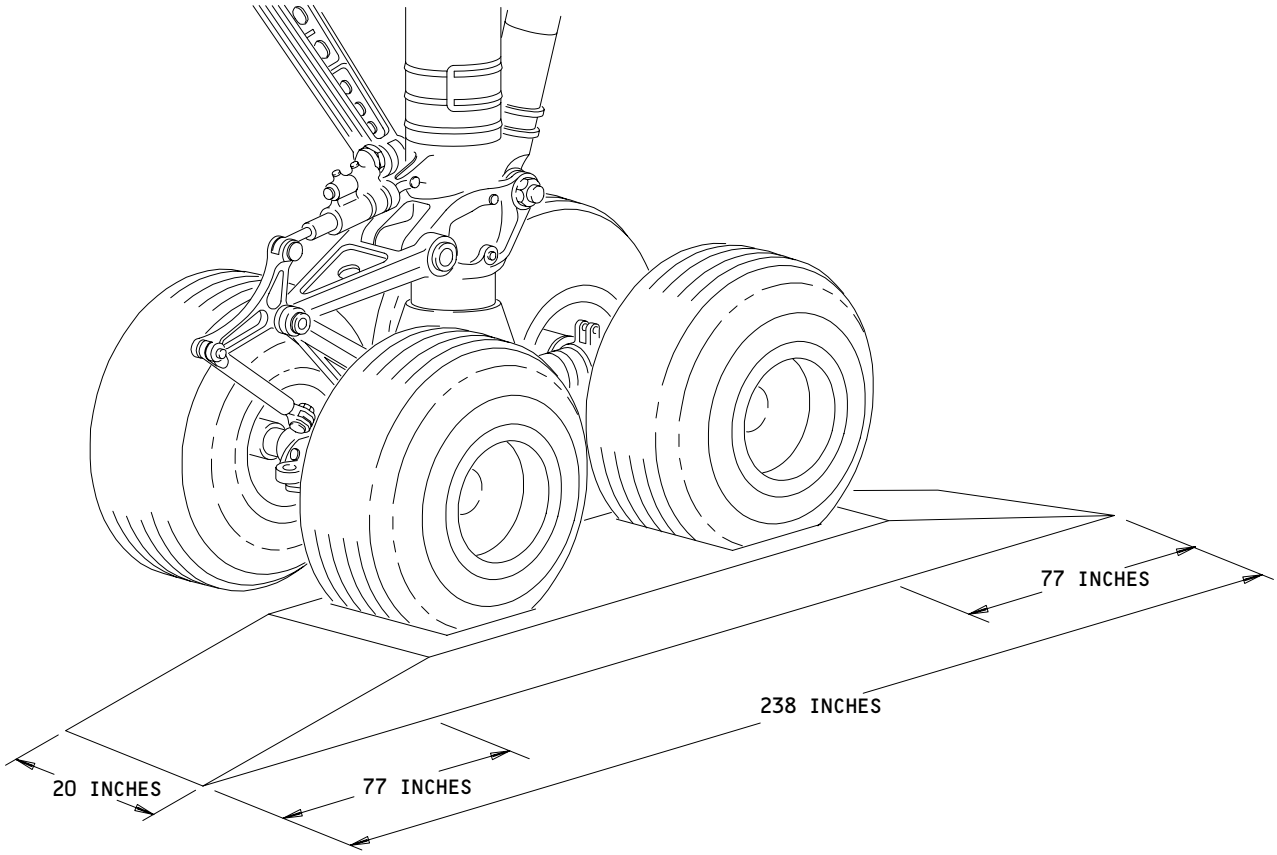
(5) If you will use the auxiliary jacking bars for the main landing gear to lift the airplane, remove the applicable antiskid transducer and support (Ref 32-41-09/401).

S 582-013

(6) If you cannot install the jack below the axle pad, lift the airplane with the auxiliary jacking bar for the main landing gear.

CAUTION: DO NOT THE REMOVE AXLE NUT. IT IS POSSIBLE THE NUTS WILL HAVE A HIGH LOAD ON THEM.

(a) Refer to Fig. 204 to find if one or two jacking adapters are necessary.




Inclined Block (Example)
Figure 203

CAUTION: YOU MUST PUSH THE JACKING BAR IN UNTIL IT TOUCHES THE AXLE END. THIS WILL PREVENT DAMAGE TO THE AXLE.

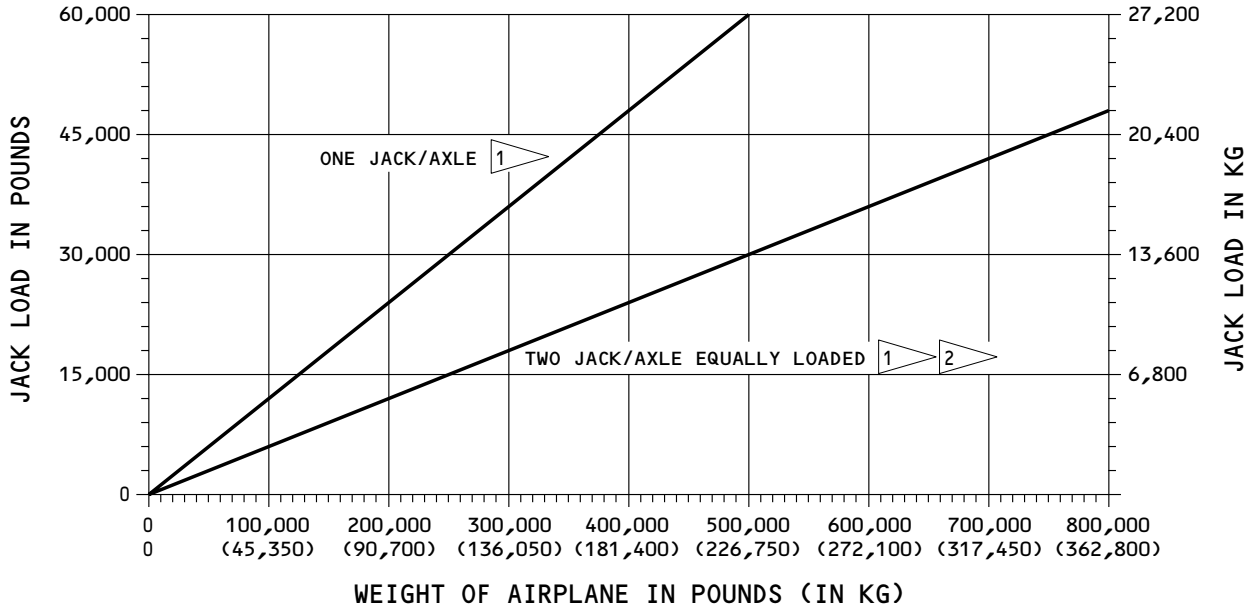
(b) Install the auxiliary jacking bar in the end of the axle as far as it is possible.

CAUTION: YOU MUST LIFT THE AIRPLANE WITH THE SHOCK STRUT INFLATED.

(c) Make sure the shock struts are inflated.
(d) Install the wheel chocks at the inflated tires of the truck that is not being lifted with the jack.

NOTE: Make sure you have a set of wheel chocks at a set of landing gear tires on the right side and the left side of the airplane. If both trucks on one side of the airplane are lifted with axle jacks, put wheel chocks at the nose gear tires.

(e) Release the brakes.
(f) Put the axle jack below the jack pad for the auxiliary jacking bar.




1 DO NOT PERMIT MORE THAN 60,000 POUNDS (27,200 KG) LOAD ON EACH AUXILIARY JACKING BAR.
2 DO NOT PERMIT MORE THAN 111,000 POUNDS (50,300 KG) TOTAL JACK LOAD ON EACH AXLE.

Jack Loads vs Airplane Weight When Using Auxiliary Jacking Bar
Figure 204

(g) Lift the axle with the auxiliary jacking bar until you can put the jack below the axle jack pad.
(h) Put the jack directly below the jack pad of the applicable gear truck.

NOTE: If one tire is flat on each axle of a gear, it is recommended that you use a jack below each axle. If only one jack is available, use cribbing below one axle while you lift the other axle. This is to prevent too much load on the tire on the axle that you will not lift, and will decrease the risk of tire failure. If two tires on one axle and one tire on other axle of a gear are flat, always replace the tire on the axle with one flat tire before you replace the tires on the other axle. Limits to lift the airplane in windy conditions are found on Fig. 202.

WARNING: WHEN YOU LIFT AN AXLE ON THE MAIN GEAR, DO NOT PUT A LOAD ON THE JACK MORE THAN 85,000 POUNDS (38,500 KG) IF THE AXLE OPPOSITE THE ONE YOU WILL LIFT HAS ONLY ONE INFLATED TIRE AND THE AXLE IS NOT HELD. IF YOU DO NOT OBEY THIS CAUTION, THE TIRE CAN FAIL BECAUSE OF TOO MUCH LOAD.

(i) Lift the jack.

NOTE: Use the jack system manufacturer's instructions on the jack placard.

I. Lift the Nose Gear Axle (Normal Tire Conditions)

S 492-014
(1) Install the jack directly below the jack pad on the nose gear axle.

NOTE: Limits to lift the airplane in wind conditions are on Fig. 202.

S 492-015

(2) Install wheel chocks on the main gear tires.

NOTE: Put them at a set of the inflated tires of one truck on the left side of the airplane and one truck on the right side of the airplane.

S 492-016

CAUTION: THE TILLER AND RUDDER PEDALS ARE DIRECTLY CONNECTED TO NOSE GEAR STEERING. IF THE TILLER OR RUDDER PEDALS MOVE, IT IS POSSIBLE TO MOVE THE NOSE GEAR OFF THE JACK. TO PREVENT THIS, MAKE SURE THE LOCKOUT PIN IS INSTALLED OR THE TORSION LINKS ARE DISCONNECTED.

(3) Install the steering lockout pin.

S 492-017

(4) Install lock assembly for the nose gear steering system.

S 862-018

CAUTION: DO NOT PERMIT MORE WEIGHT ON THE JACK OR JACK PAD THAN THE APPROVED LIMITS. IF THERE ARE GUSTY CROSSWINDS WHILE THE NOSE GEAR IS ON THE AXLE JACK, THE AXLE CAN TURN AROUND THE JACK CONE IF THE AIRPLANE WEATHERVANES. YOU CAN APPLY THE PARKING BRAKES TO DECREASE THE AIRPLANE MOVEMENT. 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.

(5) Lift the jack.

NOTE: Use the jack system manufacturer's instructions on the jack placard.

J. Lift the Nose Gear Axle (Unusual Conditions - One or More Flat Tires)

S 582-019

(1) Lift the nose gear axle.

(a) You can use one of the procedures that follow to lift the nose gear axle and there are no load limits to these:

1) Inflate the tires

2) Use the minimum height jack

3) Use the incline block

K. Remove the Jack from Below the Axle.

S 582-020

(1) Follow the instructions given by the jack system manufacturer on the jack placard to lower the jack.

# JACKING AIRPLANE FOR FUEL LEAK TEST - MAINTENANCE PRACTICES

1. General
   A. This procedure contains one task to lift the airplane on jacks to do a fuel leak test.
   B. To lift the airplane on jacks, put the jacks at the eight locations to hold the airplane.
   C. You can do a test of the fuel tank for leaks at the same time you do other maintenance or overhaul operations such as major component removal.
   D. When you do this procedure the airplane must weigh approximately 350,000 pounds (158,700 kg) with the CG at 30% MAC (This is the normal weight and CG of a defueled airplane).

TASK 07-11-04-802-001

2. Lift Airplane on Jacks
   A. General
      (1) You can remove major components (engines, landing gear, etc.) during the leak test without danger of too much load on the jack points. However, removal must be in a symmetrical manner. You must remove the component on the left before and installed after the component on the right.

          NOTE: This restriction is necessary because the left body jack usually has a higher load than the right body jack. This is because of the unsymmetrical location of the tail jack.

      (2) If you do not do a leak test at the same time as you remove major components, you do not have to follow the symmetrical removal rules.
   B. Special Tools and Equipment
      (1) 30MIT65B00112 Jack Adapter
      (2) 36MIT65B00141 Jack Adapter
      (3) 50MIT65B00112 Jack Adapter
   C. Standard Tools and Equipment
      (1) Wing and body jacks
   D. References
      (1) 07-11-01/201, Jacking Airplane
      (2) 12-11-01/301, Servicing (Fuel Replenishing)
      (3) 32-09-02/201, Air/Ground Relay System

E. Access

(1) Location Zone

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

550 Front Spar to Rear Spar From WS 994.500 to WBL 1249 (Outboard Wing Jack Point VII)

565 Inboard Flap Track Fairing - Outboard Flap, Left (Wing Jack Point IV)

650 Front Spar to Rear Spar From WS 944.500 to WBL 1249 (Outboard Wing Jack Point VIII)

665 Inboard Flap Track Fairing - Outboard Flap, Right (Wing Jack Point V)

F. Lift the Airplane

S 862-002

WARNING: YOU MUST CAREFULLY PUT THE AIR/GROUND RELAY SYSTEM IN THE AIR MODE. A FAILURE TO DO THE STEPS CORRECTLY CAN CAUSE THE AUTOMATIC OPERATION OF AIRPLANE SYSTEMS. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

(1) Put the air/ground relay system in the air mode (Ref 32-09-02/201).

S 582-003

(2) Lift the airplane to the usual height on the three primary jacks (Ref 07-11-01/201).

S 492-004

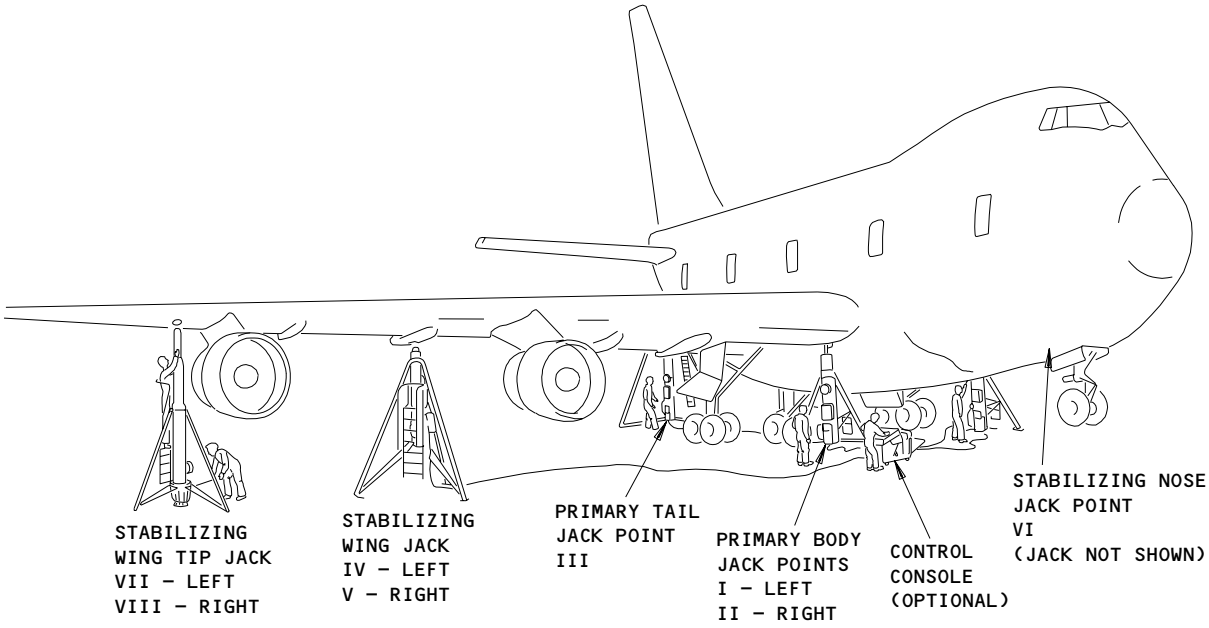
(3) Install the jack adapters at the jack points IV, V, VII, and VIII (Fig. 201).

S 492-005

(4) Put all four of the wing auxiliary jacks in their position (Fig. 201).

S 582-006

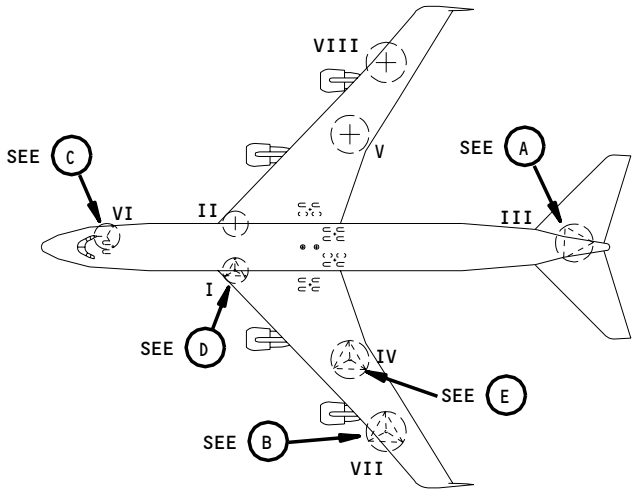
(5) Put a load on each of the auxiliary wing jack points to a load not more than 2000 pounds (900 kg).

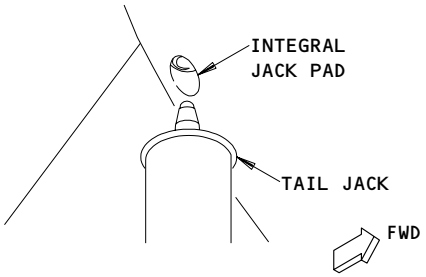



| | JACKING POINTS | LOCATION (BODY STA AND BUTTOCK LINE) | MAX STATIC LOAD IN POUNDS (KG) |
|---|---|---|---|
| I | LEFT BODY | STA 993.0<br>WBL 127.5 | 200,000 (90,700) |
| II | RIGHT BODY | STA 993.0<br>WBL 127.5 | 200,000 (90,700) |
| III | TAIL (AFT FUSELAGE) | STA 2596.0<br>RBL 30 | 96,800 (43,900) |
| IV | LEFT WING | STA 1516.0<br>WBL 583 | 30,000 (13,600) |
| V | RIGHT WING | STA 1516.0<br>WBL 583 | 30,000 (13,600) |
| VI | NOSE | STA 400.0<br>RBL 60 | 39,400 (17,800) |
| VII | LEFT OUTBD WING | STA 1681.5<br>WBL 932.6 | 25,000 (11,300) |
| VIII | RIGHT OUTBD WING | STA 1681.5<br>WBL 932.6 | 25,000 (11,300) |

NOTE: RBL = RIGHT BUTTOCK LINE; WBL = WING BUTTOCK LINE

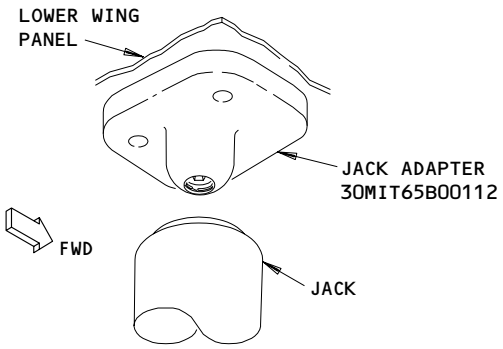
Jack Points Data
Figure 201 (Sheet 1)



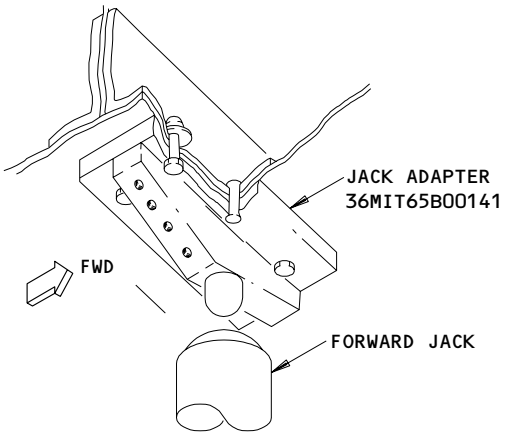

AFT FUSELAGE INTEGRAL JACK PAD (III)

A



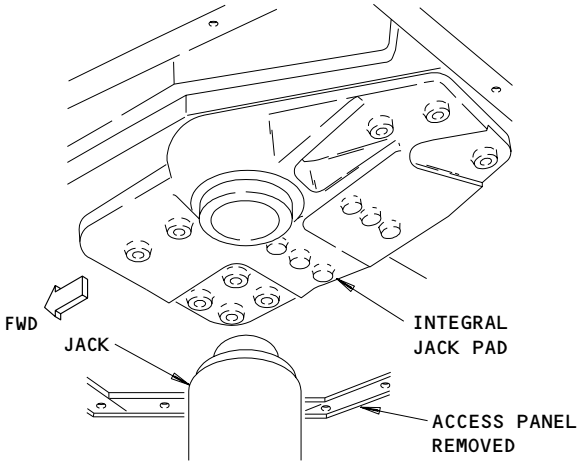

OUTBOARD WING JACK ADAPTER (VII AND VIII)

B



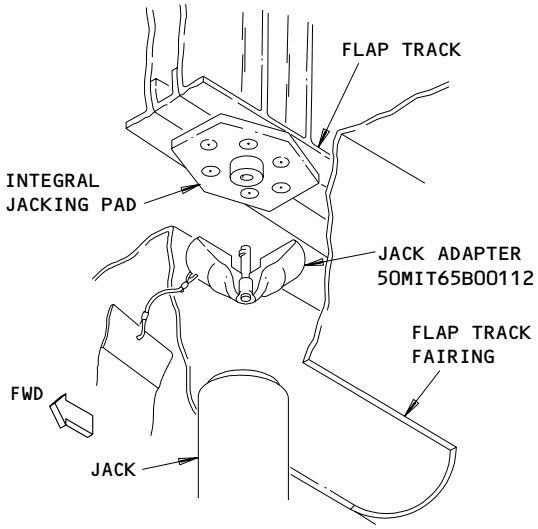

FORWARD BODY (NOSE) JACK ADAPTER (VI)

C




BODY INTEGRAL JACK PAD (I AND II)

D




WING JACK ADAPTER (IV AND V)

E

Jacking Points
Figure 201 (Sheet 2)

S 652-007

CAUTION: DO NOT FILL INBOARD MAIN TANKS WHEN THE RESERVE, OUTBOARD MAIN AND CENTER WING FUEL TANKS ARE ALL FILLED AT THE SAME TIME. TO DO THIS WILL PUT TOO MUCH LOAD ON THE AIRPLANE JACK POINTS.

(6) Fuel or defuel the reserve and the outboard main and center wing fuel tanks for a leak tests (Ref 12-11-01/301).

NOTE: You can do this in any order or combination but do not load more than the maximum load limits of the primary and auxiliary jacks.

This assumes the tanks are filled with fluid, such as Soltrol or equivalent, at 7 pounds per gallon (0.8 kg per liter) for a leak test.

S 492-008

(7) Install the jack adapter to the jack point IV (Fig. 201).

S 582-009

(8) Put the nose auxiliary jack in its position.

S 492-010

(9) Put a load on the nose auxiliary jack point to 10,000 pounds (4500 kg).

S 652-011

(10) Move the leak test fuel from other tanks to the inboard main tanks and top off the tanks.

NOTE: All other tanks must be empty before you top off the inboard main tanks.

You can do the leak test of the inboard main tanks before you do a test of the reserve, outboard main and center wing tanks. In this case, fill the inboard main tanks immediately after you install, and put a load on, the nose auxiliary jack.

G. Lower the Airplane

S 862-012

(1) Put the air/ground relay system to the ground mode (Ref 32-09-02/201).

S 582-013

(2) Lower the auxiliary jack at the jack point VI (Fig. 201).

S 582-014
(3) Lower the auxiliary jacks at the jack points IV, V, VII, and VIII.

S 092-015
(4) Remove the jack adapters at the jack points IV thru VIII (Fig. 201).

S 582-016
(5) Lower the primary jacks at the jack points I, II, and III (Ref 07-11-01/201).

# SUPPORT AIRPLANE WITH ENGINES REMOVED - MAINTENANCE PRACTICES

1. General
   A. This procedure contains one task. This task is to hold the airplane with the engines removed.
   B. This procedure contains this information to use when you remove the engines:
      (1) The center of gravity limitations
      (2) The airplane weight and ballast.
   C. You can remove or install the engines when the airplane is on jacks when certain conditions are met. These conditions are:
      (1) All the equipment is installed on the airplane.

          NOTE: It is not necessary to have the crew, payload, or fuel on the airplane.

      (2) The airplane is to the limitations and necessary ballast shown in this procedure.

TASK 07-11-05-202-001

2. Hold Airplane with Engines Removed
   A. References
      (1) 07-11-07/201, Jacking an Asymmetric Airplane
   B. Procedure

      S 582-002
      (1) Make sure the airplane has supports at primary jack points I, II and III (Fig. 201).

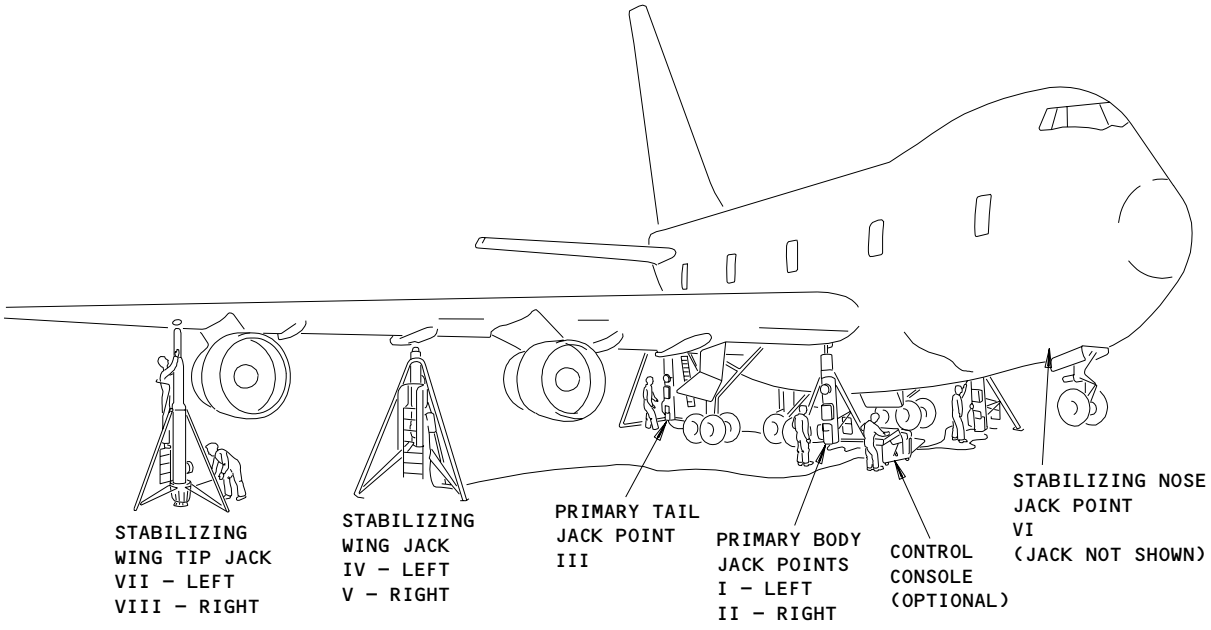
      S 582-003
      (2) Make sure the inboard wing stabilizing jack points IV and V have a load of 10,000 pounds (4500 kg) (Fig. 201).

          NOTE: The stabilizing jack load of 10,000 pounds (4500 kg) at jack points IV and V is for the SYMMETRICAL condition only. If the airplane is in an ASYMMETRIC condition, you must use the procedure in 07-11-07/201.

      S 582-004
      (3) Make sure the nose jack point VI has a load of 1000 pounds (450 kg) (Fig. 201).

      S 582-005
      (4) Make sure the airplane gross weight is between 300,000 to 474,000 pounds (136,000 to 215,000 kg) and that the CG is in the allowable limits (14 to 33 percent MAC) (Fig. 202).

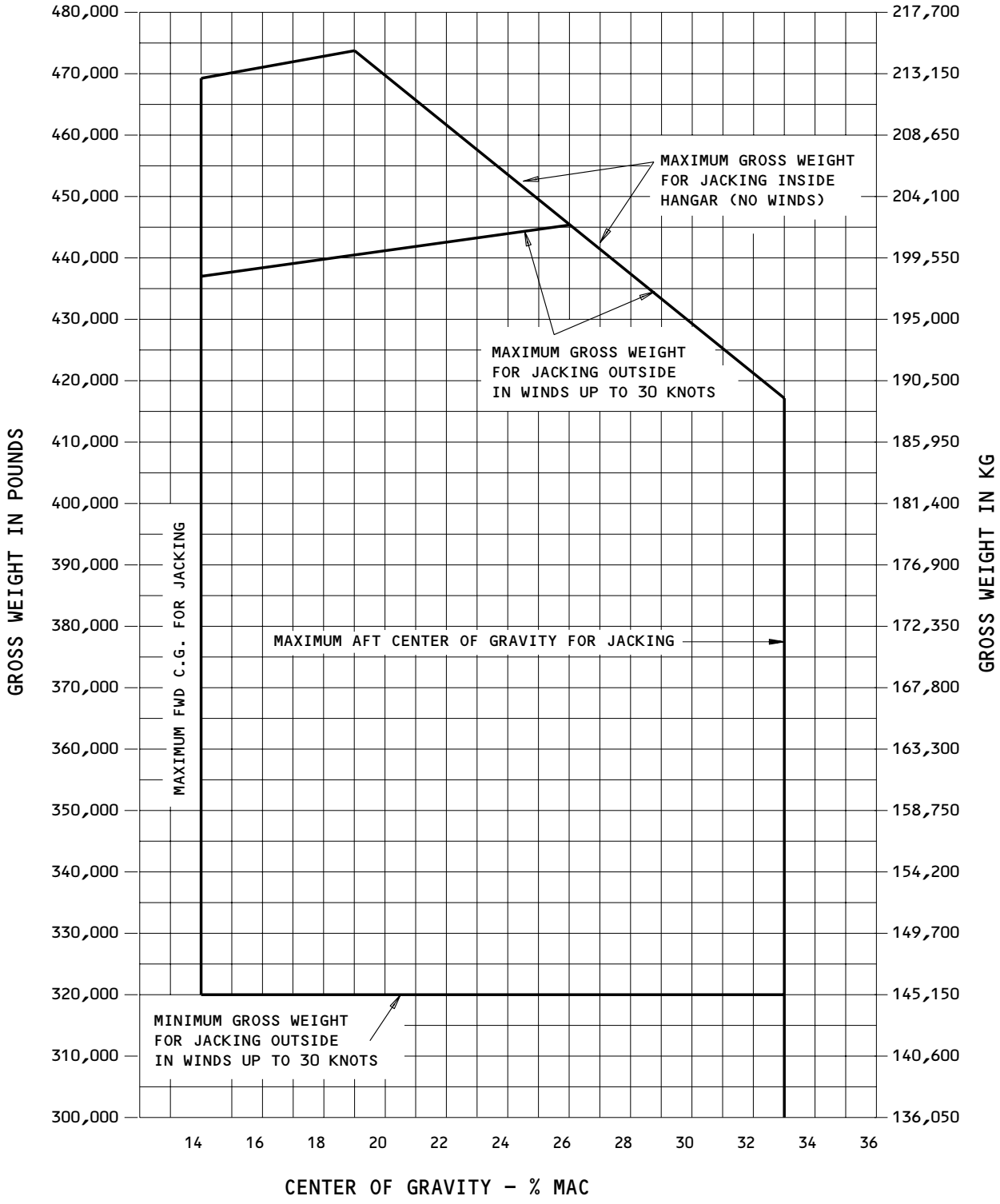
      S 582-006
      (5) Make sure the roll angle is not more than ± 3 degrees.




| | JACKING POINTS | LOCATION (BODY STA AND BUTTOCK LINE) | MAX STATIC LOAD IN POUNDS (KG) |
|---|---|---|---|
| I | LEFT BODY | STA 993.0<br>WBL 127.5 | 200,000 (90,700) |
| II | RIGHT BODY | STA 993.0<br>WBL 127.5 | 200,000 (90,700) |
| III | TAIL (AFT FUSELAGE) | STA 2596.0<br>RBL 30 | 96,800 (43,900) |
| IV | LEFT WING | STA 1516.0<br>WBL 583 | 30,000 (13,600) |
| V | RIGHT WING | STA 1516.0<br>WBL 583 | 30,000 (13,600) |
| VI | NOSE | STA 400.0<br>RBL 60 | 39,400 (17,800) |
| VII | LEFT OUTBD WING | STA 1681.5<br>WBL 932.6 | 25,000 (11,300) |
| VIII | RIGHT OUTBD WING | STA 1681.5<br>WBL 932.6 | 25,000 (11,300) |

NOTE: RBL = RIGHT BUTTOCK LINE; WBL = WING BUTTOCK LINE

Jack Points Data
Figure 201




Dynamic Airplane Jacking-Maximum Gross Weight Versus C.G.
Figure 202



316334

S 582-007

(6) If engine and/or component removal will cause an asymmetric airplane condition, lift the airplane on jacks (Ref 07-11-07/201).

MOVE LANDING GEAR ABOVE PIT - MAINTENANCE PRACTICES

1. General
   A. This procedure contains one task. The task is to move the landing gear above a pit.
   B. This procedure contains limits and instructions when you move the landing gear above the pit.

TASK 07-11-06-582-001

2. Move Landing Gear Above Pit
   A. General

      CAUTION: YOU MUST FOLLOW THE JACKING WEIGHT AND CG LIMITS IN 07-11-01/201. IF YOU DO NOT OBEY THESE LIMITS, YOU CAN CAUSE DAMAGE TO EQUIPMENT OR THE AIRPLANE.

      (1) You can use a pit for these items that follow:
          (a) To make the landing gear replacement easier
          (b) To do a test of the retraction system for the landing gear
          (c) For operations at an overhaul base
          (d) To replace the inner cylinder of the shock strut.
      (2) For operations at an overhaul base, you can hold the airplane on jacks with all the landing gear above the pits. You can do maintenance on each landing gear or on landing gear in different combinations.
      (3) Use of pits during maintenance on one or two gears, while you hold the airplane with all the other gear has some limits. In general, do not use gears and jacks in combination to hold the airplane. This causes indeterminate load problem which includes hard points and air columns (springs). Hard points can easily become loaded with too much load and cause structural damage.
   B. Reference
      (1) 07-11-01/201, Jacking Airplane
      (2) 09-11-00/201, Towing
      (3) 12-15-03/301, Wing Landing Gear Shock Strut
      (4) 12-15-04/301, Body Landing Gear Shock Strut

(5) 12-15-05/301, Nose Landing Gear Shock Strut
(6) 32-09-02/201, Air/Ground Relay System

C. Prepare the airplane to move the gear above the pit.

S 582-002
(1) Put the airplane above the pit (Ref 09-11-00/201).

D. Lift the Airplane on Jacks.

S 862-008

WARNING: YOU MUST PUT THE AIR/GROUND RELAY SYSTEM IN THE AIR MODE. AUTOMATIC OPERATION OF AIRPLANE SYSTEMS IN THE AIR MODE CAN CAUSE INJURY OR DAMAGE.

(1) Do the "Prepare Safety-Sensitive Systems for Air Mode Simulation" procedure (Ref 32-09-02/201).

S 862-009

CAUTION: YOU MUST FOLLOW THE JACKING WEIGHT AND CG LIMITS IN 07-11-01/201. IF YOU DO NOT OBEY THESE LIMITS, YOU CAN CAUSE DAMAGE TO EQUIPMENT OR THE AIRPLANE.

(2) Make sure the airplane is to the approved limits.

S 582-004
(3) Lift the airplane if you will operate all landing gear or in combinations not permitted in step E.(1)(b) (Ref 07-11-01/201).

E. Move the Landing Gear.

S 582-005
(1) Operate each landing gear or combination of gears with the conditions that follow:

CAUTION: CORRECTLY SERVICE THE SHOCK STRUTS ON THE GEARS THAT WILL HOLD THE AIRPLANE. IF THE SHOCK STRUTS ARE NOT SERVICED CORRECTLY, YOU CAN CAUSE DAMAGE TO THE AIRPLANE.

(a) Make sure the applicable shock struts are serviced correctly (Ref 12-15-03/301, 12-15-04/301, 12-15-05/301).
(b) You can use a pit for gear maintenance on airplanes with weights of not more than 564,000 pounds (255,800 kg) with a CG in a usual flight range (14 to 33% Mean Aerodynamic Chord) for the gear combinations that follow:
1) The nose gear and the two body gears hold the airplane.

NOTE: The two wing gears will be above the pits.

2) The nose gear, the two wing gear, and one body gear hold the airplane.

NOTE: The other body gear is above a pit.

(c) It is not desirable to move the airplane above a pit with the gear combinations that follow:

NOTE: This is because of more procedures that you must obey and for limits which you must obey.

1) The nose gear and the two wing gear hold the airplane.

NOTE: The two body gear are above the pits.
If you lower both of the body gear into the pits, it would cause the aft end of the airplane to move down in the direction of the ground if the CG is more aft than approximately 24% MAC. If you must retract both body gear at the same time, hold the airplane with jacks. You must obey the maximum jacking weight limit and the applicable jack point limits.

2) The nose gear, the two body gear and one wing gear hold the airplane.

NOTE: The other wing gear is above a pit.
If you use one pit below a wing gear on one side only, the body gear on that side would have to much load because of its location relative to the airplane CG. It is possible this load will be more than the design vertical load limit on the gear. It is also possible the load would be higher than the tire rated load by too much.

3) If you will operate one wing gear above a pit, remove the load on the opposite wing gear.

NOTE: With the two wing gear unloaded (one bled and the other over the pit), the load on each body gear will be reduced to approximately one and one-half times tire rated load (564,000-pound [255,800-kg] gross weight airplane). In this condition, loads on each body gear will approximate normal rated tire load on a 400,000-pound (181,400-kg) gross weight airplane.

a) To remove the load on the opposite wing gear, bleed the air from the applicable shock strut of the wing gear.

NOTE: With the two wing gear not loaded (one bled and the other over the pit), you will decrease the load on each body gear to approximately one and one-half times the tire rated load (564,000-pound [255,800-kg] gross weight airplane). In this condition, the loads on each body gear are approximately equal to the normal rated tire load on a 400,000-pound (181,400-kg) gross weight airplane.

b) An emergency alternative to removing the load on the opposite wing gear is to keep the airplane gross weight to a maximum of 400,000 pounds (181,400 kg).

NOTE: This weight will result in a tire load of approximately one and one-half times static rating on the body gear on the same side of the airplane as the unloaded wing gear. The airplane will also move to a roll attitude of approximately 4 degrees.

F. Remove the Jacks from the Airplane.

S 862-006

(1) Put the air/ground relay system to the ground mode (Ref 32-09-02/201).

S 582-007

(2) Lower the airplane (Ref 07-11-01/201).

# JACKING AN ASYMMETRIC AIRPLANE - MAINTENANCE PRACTICES

1. General
   A. This procedure contains two tasks. The two tasks give instructions to lift a 430,000-pound (195,000-kg) airplane that is not symmetrical. The first task gives instructions to lift an airplane with a center of gravity (CG) in a range of 22 to 29% MAC. The second task gives instructions to lift an airplane with a CG in a range of 26.5 to 29% MAC.
   B. The first task contains the components that when you remove them, it is not necessary to supply special ballast or fuel transfer. The airplane CG must be in a range of 22 to 29% MAC. You can remove the components before you lift the airplane or while the airplane is on jacks.
   C. The second task contains those components that when you remove them, you must transfer fuel or remove other components before you lift the airplane on jacks. The airplane CG must be in a range of 26.5 to 29% MAC. You must remove components before you lift the airplane on jacks.

      NOTE: After you lift the airplane in a condition that is not symmetrical you can install the stabilizing jacks. Do not put a load of more than 2000 pounds (900 kg) on the stabilizing jacks. This will make sure the loads on the primary jack are not more than the approved limits.

   D. This procedure contains the fuel transfer that is necessary to lift an airplane that does not have symmetrical conditions.
   E. When you remove some of the largest components from the airplane, you can cause an airplane to be not symmetrical. Sometimes, special cautions and fuel transfer will then be necessary if you must lift the airplane with a jack.
   F. To do this procedure the airplane must be in a hangar (or a no wind condition). The airplane must also weigh 430,000 pounds (195,000 kg) with a CG between 22 to 29% MAC.

TASK 07-11-07-582-001

2. Lift an Asymmetric 430,000-Pound (195,000-kg) Airplane with CG between 22 to 29% MAC
   A. References
      (1) 07-11-01/201, Jacking Airplane
      (2) 32-09-02/201, Air/Ground Relay System
   B. General

CAUTION: YOU CAN ONLY REMOVE ONE OF THE ITEMS THAT FOLLOW AT A TIME. IF YOU REMOVE MORE THAN ONE ITEM AT A TIME, YOU CAN CAUSE DAMAGE TO THE EQUIPMENT.

(1) A condition that is not symmetrical results when you remove one of the items that follows:

NOTE: You can remove components before you lift the airplane or after you lift the airplane on jacks.

(a) The engine No. 2
(b) The left outboard flap system which contains these components:
1) The foreflap, midflap, and aftflaps
2) The main carriages
3) The bogie assemblies
4) The main support track fittings
5) The fixed and movable flap track fairings
6) The mechanisms that operate all the fairings and flaps.
(c) The right outboard flap system
(d) The left inboard flap system
(e) The right inboard flap system
(f) The left inboard and outboard flap systems
(g) The right inboard and outboard flap systems
(h) The left body landing gear
(i) The right body landing gear
(j) The left wing landing gear
(k) The right wing landing gear
(l) The engine No. 2 and left inboard flap system

C. Lift the Airplane

S 842-002
(1) Prepare to lift the airplane (Ref 07-11-01/201).

S 862-003

WARNING: USE MUST PUT THE AIR/GROUND RELAY SYSTEM IN THE AIR MODE. AUTOMATIC OPERATION OF AIRPLANE SYSTEMS IN THE AIR MODE CAN CAUSE INJURY OR DAMAGE.

(2) Do the "Prepare Safety-Sensitive Systems for Air Mode Simulation" procedure (Ref 32-09-02/201).

S 582-004

(3) Lift the airplane with the jacks (Ref 07-11-01/201).

NOTE: If one of the items in par. 2.B. was removed before the airplane was lifted, the load on each jack pad will be different. Monitor the jack pad loads to make sure the maximum load is not more than the approved limit. When the airplane is on jacks and the stabilizing jacks are installed, the load must not be more than 2000 pounds (900 kg). This is to make sure the loads on the primary jacks are not more than the approved limits.

S 092-005

CAUTION: IF YOU INSTALLED THE STABILIZING JACKS, REMOVE THEM BEFORE YOU LOWER THE AIRPLANE. YOU MUST REMOVE THEM TO PREVENT STRUCTURAL DAMAGE TO THE AIRPLANE.

(4) If the stabilizing jacks are installed, remove them.

S 582-014

(5) Lower the airplane to the ground and put it back to the usual condition (Ref 07-11-01/201).

S 862-006

(6) Put the air/ground relay system to the ground mode (Ref 32-09-02/201).

TASK 07-11-07-582-007

3. Jack an Asymmetric 430,000-Pound (195,000-kg) Airplane with CG between 26.5 to 29% MAC

A. References

(1) 07-11-01/201, Jacking Airplane

B. Prepare to Lift the Airplane

S 652-008

CAUTION: YOU CAN ONLY REMOVE ONE OF THE ITEMS THAT FOLLOW AT A TIME. IF YOU REMOVE MORE THAN ONE ITEM AT A TIME, YOU CAN CAUSE DAMAGE TO THE EQUIPMENT.

(1) Transfer the fuel as it is necessary as follows to provide a symmetrical airplane.

NOTE: With CG aft of 26.5% MAC and if one of the items that follow will be removed, you must transfer the fuel before the component removal. You must transfer the fuel and remove the component before you lift the airplane on jacks.

| ITEM | NECESSARY FUEL TRANSFER |
|---|---|
| Engine No. 1 | 4000 pounds (1814 kgs) from the main tank No. 4 to the main tank No. 2 |
| Engine No. 3 | 4500 pounds (2041 kgs) from the main tank No. 1 to main tank No. 3 |
| Engine No. 1 and left outboard flap system | 5,000 pounds (2268 kgs) from the main tank No. 4 to the main tank No. 2 |
| Engine No. 3 and right inboard flap system | 2150 pounds (975 kgs) from the main tank No. 1 to the main tank No. 3 |
| Engine No. 4 | 11,000 pounds (4990 kgs) from the main tank No. 1 to the main tank No. 3 |
| Engine No. 4 and right outboard flap system | 11,800 pounds (5353 kgs) from the main tank No. 1 to the main tank No. 3 |
| Engines No. 1 and No. 2 | 12,350 pounds (5602 kgs) from the main tank No. 4 to the main tank No. 2 |
| Engines No. 3 and No. 4 | 18,400 pounds (8346 kgs) from the main tank No. 1 to the main tank No. 3 |
| Engines No. 3, No. 4, and right outboard flap system | 19,000 pounds (8618 kgs) from the main tank No. 1 to the main tank No. 3 |

| ITEM | NECESSARY FUEL TRANSFER |
|---|---|
| Engines No. 1, No. 2, and left outboard flap system | 13,200 pounds (5988 kgs) from the main tank No. 4 to the main tank No. 2 |

C. Lift the Airplane

S 842-009

(1) Prepare to lift the airplane on jacks (Ref 07-11-01/201).

S 862-010

WARNING: REFER TO 32-09-02/201 TO PUT THE AIR/GROUND RELAY SYSTEM IN THE AIR MODE. AUTOMATIC OPERATION OF AIRPLANE SYSTEMS IN THE AIR MODE CAN CAUSE INJURY OR DAMAGE.

(2) Put the air/ground relay system in the air mode (Ref 32-09-02/201).

S 582-011

(3) Lift the airplane with the jacks (Ref 07-11-01/201).

NOTE: If one of the items in par. 2.B. was removed before the airplane was lifted, the load on each jack pad will be different. Monitor the jack pad loads to make sure the maximum load is not more than the approved limit. When the airplane is on jacks and the stabilizing jacks are installed, the load must not be more than 2000 pounds (900 kg). This is to make sure the loads on the primary jacks are not more than the approved limits.

S 092-012

CAUTION: IF YOU INSTALLED THE STABILIZING JACKS, REMOVE THEM BEFORE YOU LOWER THE AIRPLANE. YOU MUST REMOVE THEM TO PREVENT STRUCTURAL DAMAGE TO THE AIRPLANE.

(4) If you installed the stabilizing jacks, remove them.

S 582-015

(5) Lower the airplane to the ground and put it back to the usual condition (Ref 07-11-01/201).

S 862-013

(6) Put the air/ground relay system to the ground mode (Ref 32-09-02/201).

CARGO AND FUEL LOADING SUPPORT - MAINTENANCE PRACTICES

1. General
   A. This procedure contains two tasks. The first task is to install a support stanchion to hold the airplane when you load cargo or fuel. The second task is to install a jack at jack point III to hold the airplane when you load cargo or fuel.
   B. The primary function of tail support is to prevent the airplane tail from moving down if an aft center of gravity (referred to as CG) condition occurs. The operator should develop procedures for the loading and unloading of cargo and fuel which will make tail support not necessary.
   C. Tail support is recommended during cargo loading and unloading or fueling operations if you will not do steps to control the airplane CG movement.
   D. You must keep the airplane CG between the limits given in the Weight and Balance Manual.
   E. The tail support stanchion has a standard 15-ton (13,600-kg) wing tip jack that has modifications and is equipped with a special headstock. The headstock connects to a 2-inch (5 centimeter) diameter ball connected to the airplane at jack point III on the aft fuselage.
   F. You must follow the limits shown in MM 10-11-03/201, Fig. 201, when you use the Tail Support Stanchion in high winds.

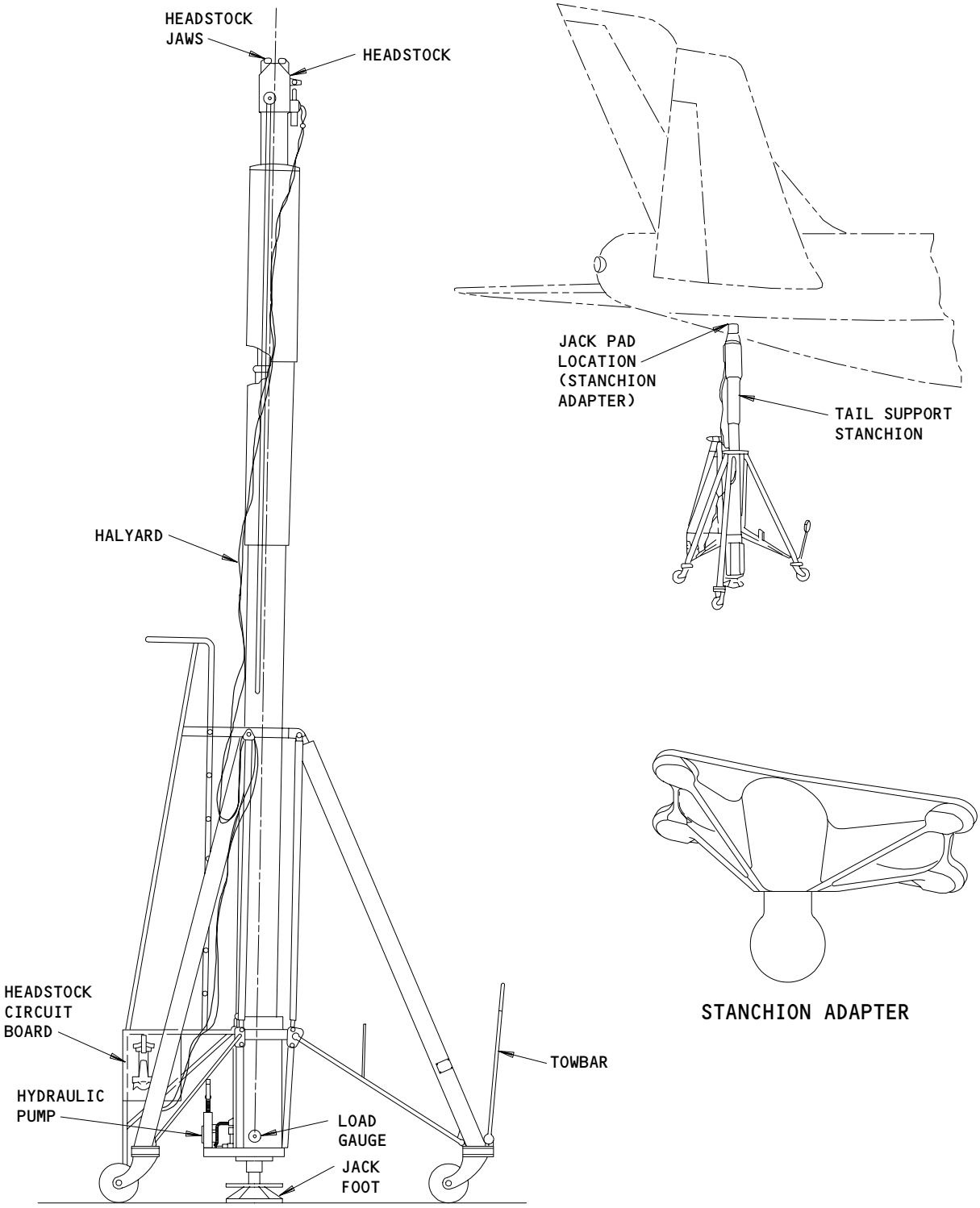
TASK 07-11-08-492-001

2. Tail Support Stanchion Installation
   A. Special Tools and Equipment
      (1) Tail Support Stanchion - (Commercially Available)
   B. Access
      (1) Location Zone
          314 Stabilizer Torsion Box Compartment, RH (Aft Jack Point)
          Station 2596, Right Buttock Line 30
   C. Prepare to Install the Support Stanchion (Fig. 201).

      S 212-002
      (1) Make sure the adapter for the support stanchion is installed.

      S 492-003
      (2) Extend the jack ram to a length of 40 inches (1 meter).

      S 492-004
      (3) Put the stanchion below the aft jack point (stanchion adapter) on the airplane.




Tail Support Stanchion Installation - STA 2596
Figure 201

D. Install the Support Stanchion (Fig. 201).

S 422-014

WARNING: DO NOT USE THE SUPPORT STANCHION TO LIFT THE AIRPLANE. IF YOU USE THE SUPPORT STANCHION TO LIFT THE AIRPLANE, IT CAN CAUSE INJURY TO PERSONS AND DAMAGE TO THE AIRPLANE.

(1) Install the support stanchion.
   (a) Turn the valve on the stanchion base clockwise to the closed position.
   (b) Extend the stanchion until the headstock is approximately 10 inches (25 centimeters) below the support stanchion ball on the airplane.

      NOTE: Use the hydraulic pump on the stanchion base to extend the jack ram.

   (c) Move the valve on the headstock circuit board to the open position.
   (d) Use the pump to move the jaws on the headstock to their open position.

      NOTE: You will feel resistance in the pump handle when you get to the full open position.

   (e) With the rope halyard, extend the positioning pointer.
   (f) Move the stanchion if it is necessary until the stanchion is directly below the ball on the airplane.
   (g) Move the pointer down into the headstock.
   (h) Extend the stanchion until the ball on the airplane seats in the cup of the headstock.

      NOTE: Use the pump to extend the stanchion. When the ball seats in the cup of the headstock, the pressure on the gauge will increase.

   (i) Move the valve on the headstock circuit board to the closed position.
   (j) With the pump, close the jaws of the headstock around the ball on the airplane.

      NOTE: You will feel resistance in the pump handle when you get to the closed position.

   (k) Turn the valve on the stanchion base counterclockwise and see that the headstock stays attached to the airplane.

(l) If the stanchion disengaged from the airplane, connect the stanchion to the ball again:
1) Extend the stanchion until the ball on the airplane seats in the cup of the headstock.

NOTE: Use the pump to extend the stanchion. When the ball seats in the cup of the headstock, the pressure on the gauge will increase.

2) Move the valve on the headstock circuit board to the closed position.
3) With the pump, close the jaws of the headstock around the ball on the airplane.

NOTE: You will feel resistance in the pump handle when you get to the closed position.

(m) Turn the valve on the stanchion base clockwise to the closed position.
(n) Extend the jack foot screw until the jack foot firmly touches the ramp surface.
(o) Use the adjustable hand pump to put a load on the stanchion if it is necessary.

NOTE: After you connect the stanchion to the airplane, you can put a load on the stanchion as much as approximately 22,500 pounds <10,200 kilograms). Use the adjustable hand pump to do this. The usual recommended load of the stanchion is between 5,000 - 10,000 pounds (2,000 - 4,500 kilograms).

The relief valve in the hydraulic circuit relieves at 25,000 pounds (10,200 kilograms) ± 10%.

E. Remove the Support Stanchion (Fig. 201).

S 092-006
(1) Remove the support stanchion.
(a) Turn the valve on stanchion base counterclockwise.
(b) Permit the stanchion to move down until the weight is on the headstock jaws.

NOTE: The load gage should show zero pressure.

(c) Turn the valve to the full clockwise position.
(d) Move the valve on the headstock circuit board to the open position.
(e) Use the headstock pump to open the jaws to the full open position.
(f) Turn the valve on the stanchion base counterclockwise.

(g) Permit the jack ram to move down approximately 40 inches (1 meter) then close the valve.
(h) Lift the jack foot and move the stanchion away from the airplane.

TASK 07-11-08-492-007

3. Tail Support Jack at Jack Point III - Installation

A. Standard Tools and Equipment
(1) Fuselage jack

B. Access
(1) Location Zone
314 Stabilizer Torsion Box Compartment, RH (Aft Jack Point)
Station 2596, Right Buttock Line 30

C. Prepare to Support the Tail at Jack Point III (Fig. 202).

S 492-008

(1) Put the jack in the correct position.
(a) Put the jack directly below the jack pad.
(b) Put the caster wheels in an aligned position.

NOTE: With the caster wheels aligned, they can follow one another when the jack turns clockwise (counterclockwise, where applicable).

CAUTION: DO NOT PERMIT THE JACKSCREW TO EXTEND MORE THAN THE APPROVED EXTENSION ON THE PLACARD. IF YOU EXTEND THE JACKSCREW TOO FAR, YOU CAN CAUSE DAMAGE TO THE JACK AND THE AIRPLANE.

(c) Turn the inner screw to keep a 3 inch clearance between the jack and the jack pad before you apply pressure to the jack.

D. Support the Tail at Jack Pad III (Fig. 202).

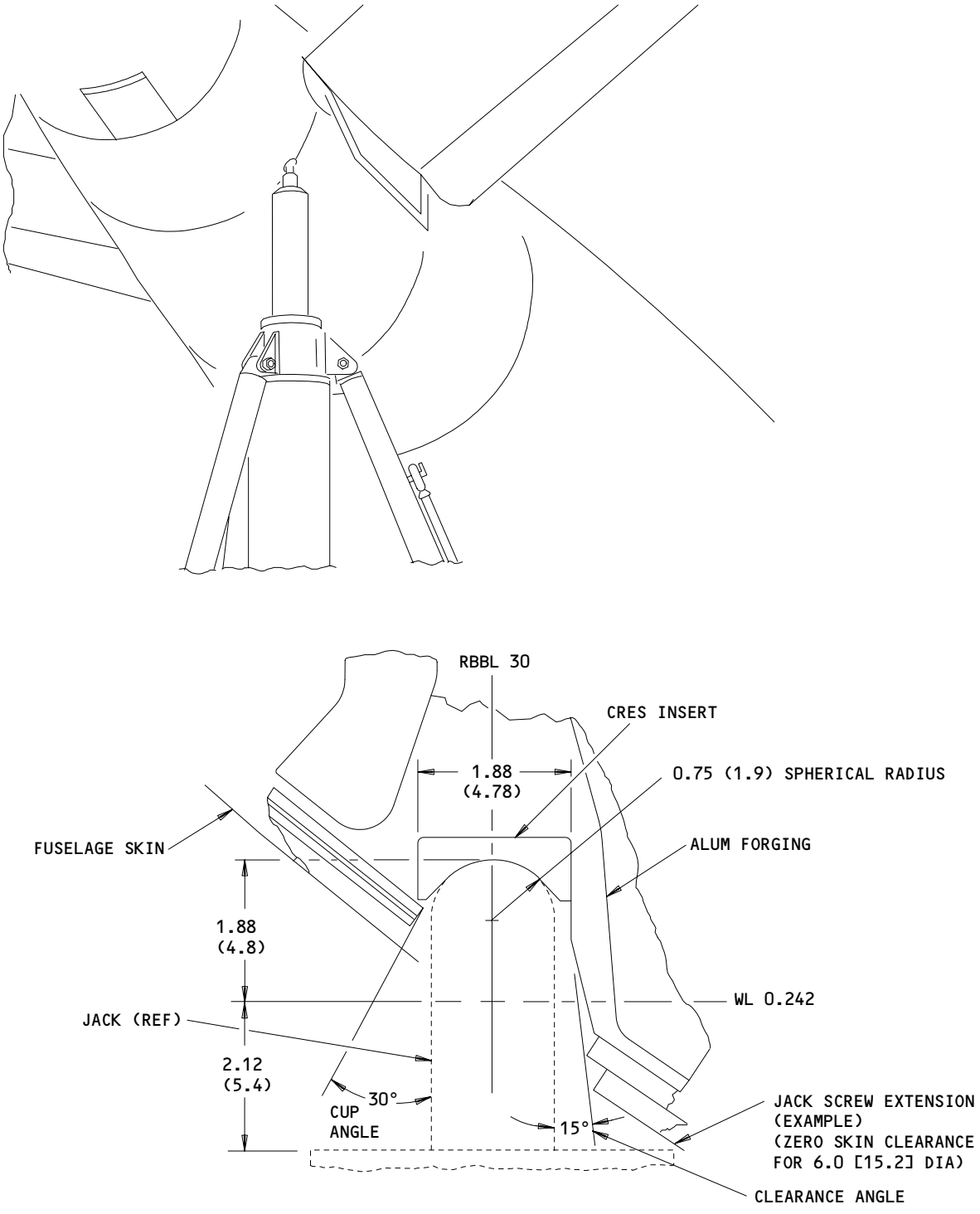
S 492-009

(1) Preload the jack to between 5,000 - 10,000 pounds (2,000 - 4,500 kilograms).

S 492-013

CAUTION: YOU MUST KEEP A LOAD ON THE JACK AT ALL TIMES. IF YOU DO NOT KEEP A LOAD ON THE JACK YOU CAN CAUSE STRUCTURAL DAMAGE TO THE AIRPLANE.

(2) Keep a 5,000 pound (2,200 kilogram) minimum load while the jack is in place.




NOTE: THIS JACK POINT REQUIRES NO GSE ADAPTER.
DIMENSIONS ARE IN INCHES (CENTIMETERS)

Tail Jack Point III - STA 2596
Figure 202

E. Remove the Tail Support at Jack Pad III (Fig. 202).

S 582-011
(1) Follow the jack instructions to lower the jack.

S 092-012
(2) Make sure the airplane jack is fully retracted and the jackscrew extension is in the full down position.

## SHORING - MAINTENANCE PRACTICES

1. General
   A. This procedure contains two tasks. The first task gives steps to shore the airplane body. The second task gives steps to shore the airplane wings.
   B. This procedure gives steps and limits when you shore the body and the wings of the airplane.
   C. In all cases when you will hold the airplane other than with the main landing gear, the jack positions should be included as a point of support. The airplane should be shored on a hard surface in the most level ground area available. If it will be outside, take into consideration the wind conditions and blast effects from other airplanes.
   D. If more data is necessary, refer to SRM 51-50-02 of the Structural Repair Manual.

TASK 07-20-00-582-012

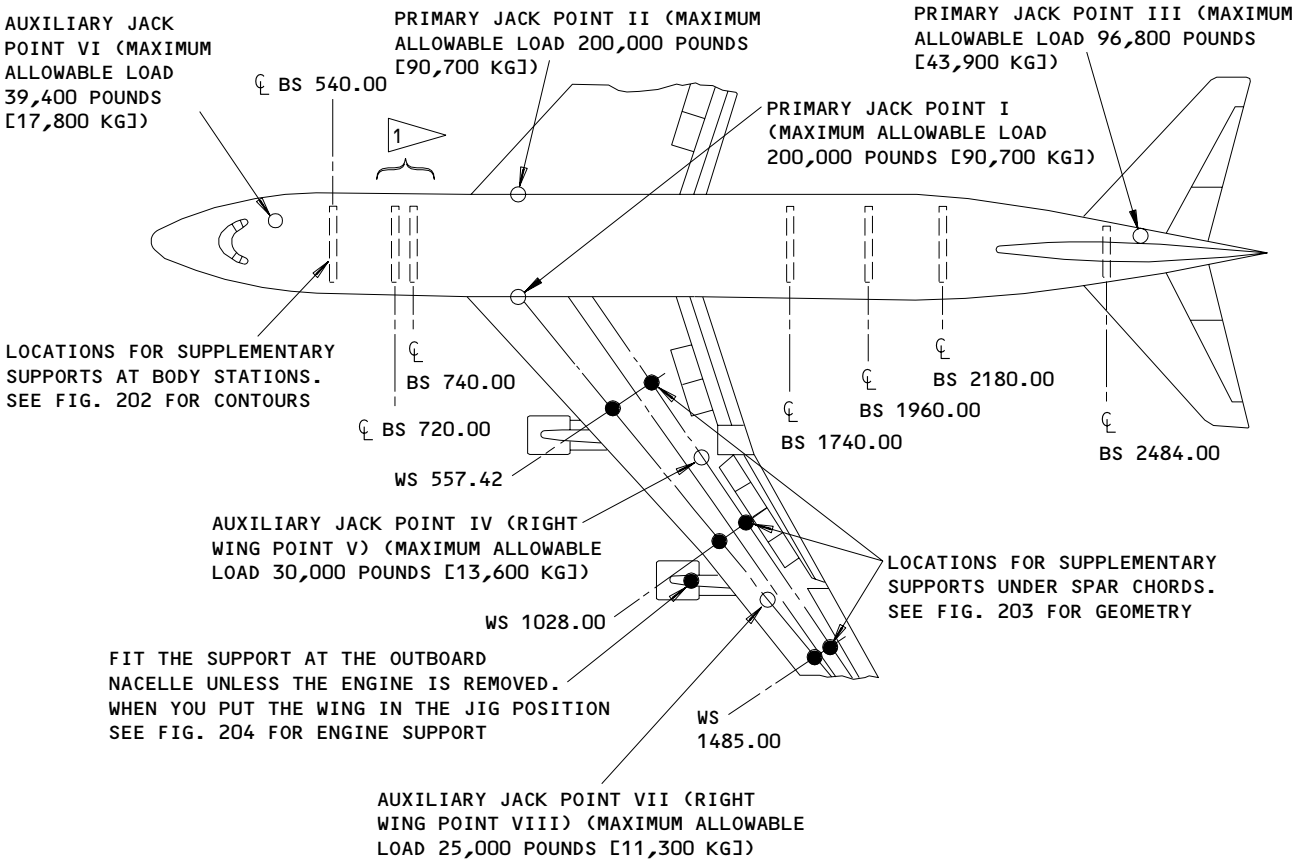
2. Body Shoring (Fig. 201)
   A. References
      (1) AMM 07-11-02/201, Jacking Airplane
   B. Procedure

      S 582-002
      (1) Lift the airplane on the jacks at the jack points I, II, and III (AMM 07-11-01/201).

      S 492-003
      (2) Put the shoring below the body at the shore points shown (Fig. 201).

      NOTE: When you shore the body, you will usually lift the body on the jacks, then lower it onto supplementary body supports.

      The aft body jack is not on the airplane centerline and therefore has a tendency to twist the body. When this will have an unwanted effect on the repairs you will make, you can remove the aft body jack. Do this only if you installed the supplemental body supports and have the correct loads on them.




| SUPPLEMENTARY SUPPORT LOCATION | MAXIMUM ALLOWABLE LOAD IN JIGGED POSITION |
|---|---|
| BS 540.00 | 18,000 POUNDS (8,100 KG) |
| BS 720.00<br>BS 740.00 | 36,000 POUNDS (16,300 KG) 1 |
| BS 1740.00 | 16,000 POUNDS (7,200 KG) |
| BS 1960.00 | 16,000 POUNDS (7,200 KG) |
| BS 2180.00 | 16,000 POUNDS (7,200 KG) |
| BS 2484.00 | 40,000 POUNDS (18,100 KG) |

FUSELAGE SUPPORT LOADS

| SUPPORT LOCATION | | THEORETICAL SUPPORT LOAD IN JIGGED POSITION |
|---|---|---|
| WS 557.42 | FRONT SPAR | 34,800 POUNDS (17,400 KG) |
| | REAR SPAR | 11,700 POUNDS (5,300 KG) |
| WS 1028.0 | FRONT SPAR | 27,900 POUNDS (12,600 KG) |
| | REAR SPAR | 0 |
| WS 1485.0 | FRONT SPAR | 3,500 POUNDS (1,500 KG) |
| | REAR SPAR | 550 POUNDS (240 KG) |
| OUTBOARD NACELLE | | 6,780 POUNDS (3,000 KG) |

WING SUPPORT LOADS

1 UNITIZED SUPPORT MAX LOAD MUST BE EQUALLY DISTRIBUTED BETWEEN THE SUPPORTS AT THESE LOCATIONS.

Shoring Airplane
Figure 201

S 492-007

CAUTION: WHEN YOU SUPPLY THE SHORING, PREVENT SCRATCHES TO THE SURFACE. ALSO, DO NOT PERMIT LOADS MORE THAN THOSE APPROVED FOR SHORING. IF YOU DO NOT OBEY THE CAUTION, YOU CAN CAUSE DAMAGE TO THE AIRPLANE.

(3) Assemble the necessary shoring (Fig. 202).

NOTE: Contour data shown in Fig. 202 will help you when you assemble the body shoring.

TASK 07-20-00-582-011

3. Wing Shoring (Fig. 201)

A. Special Tools and Equipment

(1) 64ME65B00713 Front Adapter and Yoke (GE and RR engine handling)

(2) 12ME65B00713 Rear Adapter and Yoke (GE and RR engine handling)

B. References

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

C. Procedure

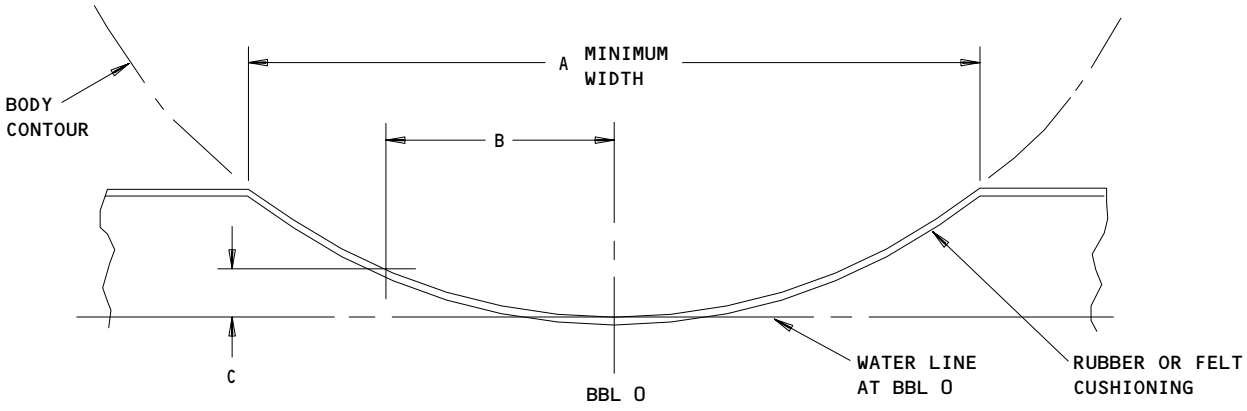
S 582-005

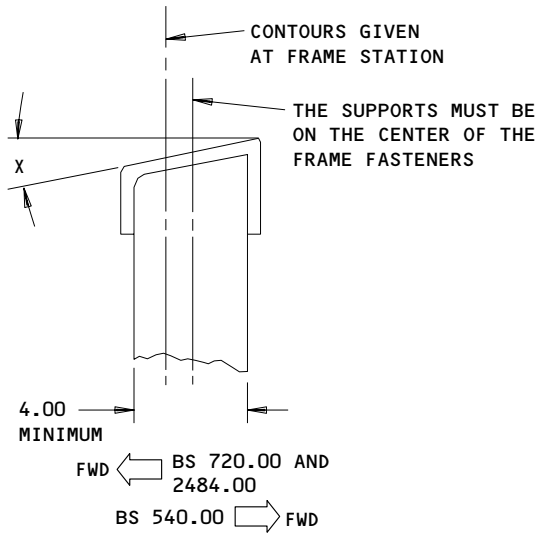
(1) Lift the airplane at the jack points I, II, III, IV, V, VII, and VIII (AMM 07-11-01/201).

S 492-006

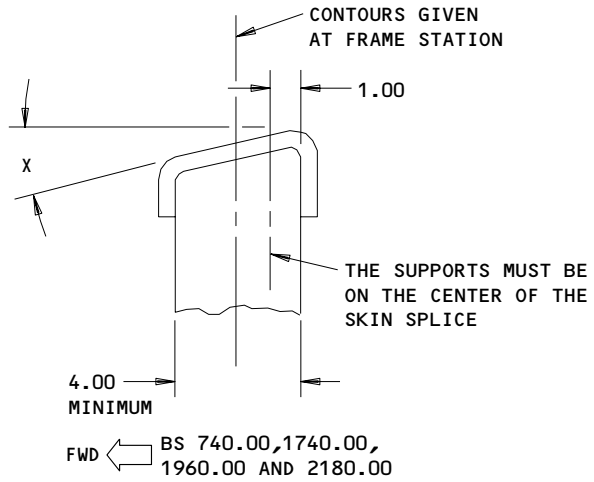
(2) Put the shoring below the wing at the shore points shown (Fig. 201).

NOTE: When you shore the wing, you will usually lift the wing on the jacks, then lower it onto supplementary wing supports.




SECTION AT BBL 0




SECTION AT BBL 0

| BS 540.00 | | | BS 720.00,BS 740.00 AND BS 1740.00 | | | BS 1960.00 | | | BS 2180.00 | | | BS 2484.00 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DIM A | | 160.00 | DIM A | | 160.00 | DIM A | | 160.00 | DIM A | | 140.00 | DIM A | | 122.94 |
| WL AT BBL 0 | | 95.16 | WL AT BBL 0 | | 91.00 | WL AT BBL 0 | | 104.30 | WL AT BBL 0 | | 145.30 | WL AT BBL 0 | | 209.88 |
| DIM B | DIM C | ANGLE X | DIM B | DIM C | ANGLE X | DIM B | DIM C | ANGLE X | DIM B | DIM C | ANGLE X | DIM B | DIM C | ANGLE X |
| 10.00 | 0.25 | 3°-0' | 10.00 | 0.35 | 0° | 10.00 | 0.15 | 7°-0' | 10.00 | 0.15 | 12°-0' | 9.86 | 0.36 | 12°-0' |
| 20.00 | 1.07 | 3°-0' | 20.00 | 1.45 | 0° | 20.00 | 0.70 | 7°-0' | 20.00 | 0.65 | 12°-0' | 21.07 | 1.90 | 12°-0' |
| 30.00 | 2.52 | 3°-0' | 30.00 | 3.30 | 0° | 30.00 | 1.75 | 7°-0' | 30.00 | 1.70 | 12°-0' | 30.05 | 4.41 | 12°-0' |
| 40.00 | 4.70 | 2°-0' | 40.00 | 6.01 | 0° | 40.00 | 3.50 | 7°-0' | 40.00 | 3.45 | 12°-0' | 40.12 | 9.36 | 12°-0' |
| 50.00 | 7.75 | 2°-0' | 50.00 | 9.66 | 0° | 50.00 | 6.26 | 7°-0' | 50.00 | 6.25 | 12°-0' | 45.14 | 13.00 | 12°-0' |
| 60.00 | 11.84 | 1°-0' | 60.00 | 14.37 | 0° | 60.00 | 10.35 | 7°-0' | 60.00 | 10.40 | 12°-0' | 49.94 | 17.43 | 12°-0' |
| 70.00 | 17.22 | 1°-0' | 70.00 | 20.30 | 0° | 70.00 | 16.15 | 7°-0' | 70.00 | 16.35 | 12°-0' | 54.97 | 23.50 | 12°-0' |
| 80.00 | 24.27 | 0°-30' | 80.00 | 27.73 | 0° | 80.00 | 23.35 | 7°-0' | | | | 58.12 | 28.41 | 12°-0' |
| | | | | | | | | | | | | 61.47 | 35.12 | 12°-0' |

Contours for Body Shoring
Figure 202

S 492-008

CAUTION: WHEN YOU SUPPLY THE SHORING, PREVENT SCRATCHES TO THE SURFACE. ALSO, DO NOT PERMIT LOADS MORE THAN THOSE APPROVED FOR SHORING. IF YOU DO NOT OBEY THE CAUTION, YOU CAN CAUSE DAMAGE TO THE AIRPLANE.

(3) Assemble the necessary shoring (Fig. 203).

NOTE: Contour data shown in Fig. 203 will help you when you assemble the wing shoring.

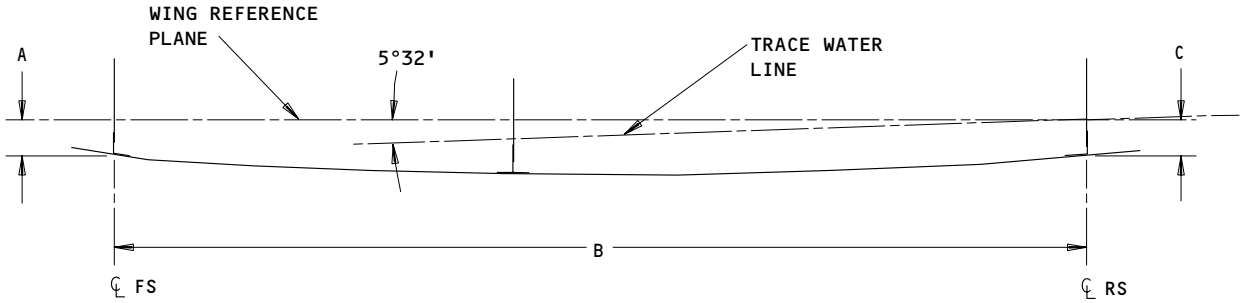
(a) Along the wing spars between the body buttock lines 150, and 430 and the landing gear beam 430, you can install the shoring with loads not more than these:

| | |
|---|---|
| Front Spar | 15,000 pounds per foot (22,320 kg per meter) |
| Mid Spar | 8,000 pounds per foot (11,900 kg per meter) |
| Rear Spar | 23,000 pounds per foot (34,200 kg per meter) |
| Landing Gear Support Beam | 24,000 pounds per foot (35,700 kg per meter) |

(b) You can supply shoring below the spars or the landing gear support as padded beams on the jacks.

S 492-009

(4) Shore the outboard nacelle with the engine support (Fig. 204) unless you removed the engine.

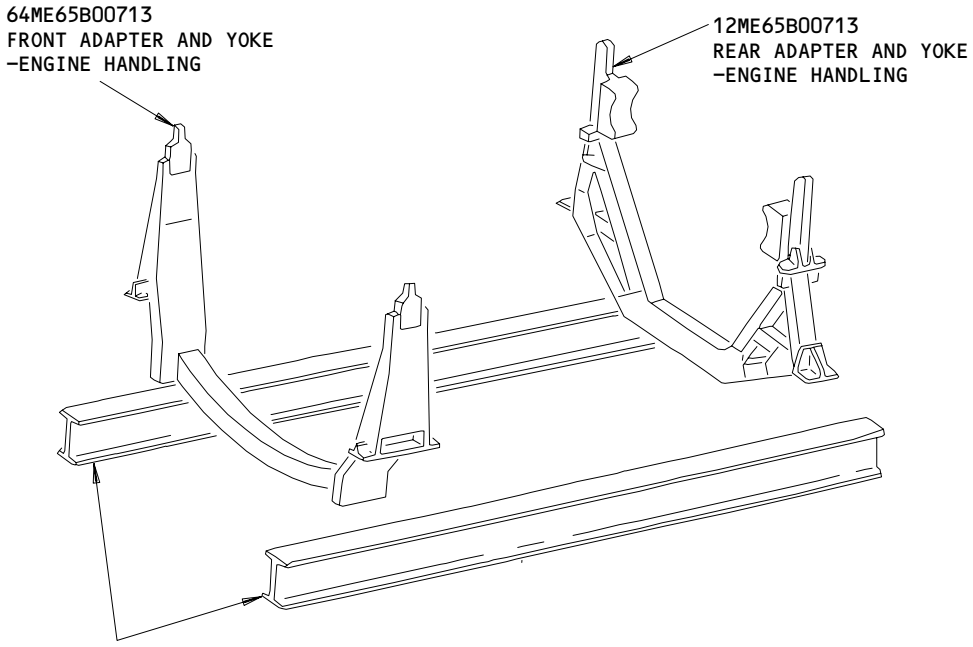



SECTION AT WING STATION

| WING STATION | DIM. A | DIM. B | DIM. C |
|---|---|---|---|
| 557.42 | 11.92 | 162.00 | 14.48 |
| 1028.0 | 4.70 | 107.85 | 4.89 |
| 1485.0 | 5.68 | 58.30 | 1.85 |

NOTE: HOLD THE WING AT THE FRONT AND REAR SPAR CHORDS BY PADS OF NOT LESS THAN 80 SQUARE INCHES EACH. CHORDWISE DIMENSIONS OF PADS ARE EQUAL TO WIDTH OF SPAR CHORD.

Geometry for Wing Shoring
Figure 203




ATTACH THE ADAPTER AND YOKE ASSEMBLY ON BEAMS. MAKE SURE THE BEAMS HAVE SUFFICIENT SUPPORT FOR THE ENGINE WEIGHT.

NOTE: THE FRONT AND REAR ADAPTER AND YOKE ASSEMBLIES ARE PART OF THE GROUND SUPPORT EQUIPMENT.

Engine Shoring
Figure 204