

CHAPTER

08

**LEVELING AND
WEIGHING**



**737-7/8/8200/9/10
AIRCRAFT MAINTENANCE MANUAL**

**CHAPTER 08
LEVELING AND WEIGHING**

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WEIGHING - MAINTENANCE PRACTICES

1. General

- A. This procedure refers the mechanic to the Weight and Balance Manual.

TASK 08-11-00-580-801

2. Weigh the Airplane

A. Procedure

SUBTASK 08-11-00-580-001

- (1) Refer to the Weight and Balance Manual for the procedures to prepare and weigh the airplane.

———— **END OF TASK** ————

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LEVEL AIRPLANE WITH A PLUMB BOB AND INCLINOMETERS - MAINTENANCE PRACTICES

1. General

A. This procedure has this task:

(1) Level the airplane with a plumb bob and inclinometers.

B. The airplane has two types of leveling indicators in the main landing gear wheel well. It has a plumb bob scale and the lateral and longitudinal inclinometers. Use these leveling devices to make the airplane level for general maintenance. Do not use the inclinometers to make the airplane level to weigh the airplane.

TASK 08-20-02-580-801

2. Level the Airplane With a Plumb Bob and Inclinometers

(Figure 201, Figure 202)

A. **General**

(1) Do this task to level the airplane or to put the airplane on jacks to do the following procedures:

(a) Weigh the airplane.

(b) Do general airplane maintenance.

(c) Do the landing gear retraction tests.

B. **References**

Reference	Title
07-10-01-580-801	Lift the Airplane on Jacks (P/B 201)
07-10-01-580-802	Lower the Airplane off Jacks (P/B 201)
10-11-01-580-801	Airplane Parking (P/B 201)
12-15-31-610-802	Main Landing Gear Shock Strut Servicing, Airplane on the Ground (P/B 301)
12-15-41-610-802	Nose Landing Gear Shock Strut Servicing, Airplane on the Ground (P/B 301)
32-00-01-480-801	Landing Gear Downlock Pins Installation (P/B 201)

C. **Location Zones**

Zone	Area
740	Subzone - Right Main Landing Gear and Landing Gear Doors

D. **Prepare to Level the Airplane**

SUBTASK 08-20-02-580-001

(1) Park the airplane where the ground is as level as possible.

(a) Do this task: Airplane Parking, TASK 10-11-01-580-801.

NOTE: The airplane must be parked on a level surface to do this procedure.

SUBTASK 08-20-02-800-001

 WARNING	MAKE SURE THE DOWNLOCK PINS ARE INSTALLED ON ALL THE LANDING GEAR. WITHOUT THE DOWNLOCK PINS, THE LANDING GEAR COULD RETRACT AND CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.
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(2) Install the nose and main landing gear downlock pins, do this task: Landing Gear Downlock Pins Installation, TASK 32-00-01-480-801.

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SUBTASK 08-20-02-010-001

- (3) Open the main landing gear doors.

E. Level the Airplane With a Plumb Bob and Inclinometers

SUBTASK 08-20-02-480-001

- (1) Attach the plumb bob fitting to the bracket in the wheel well.
 - (a) The bracket is directly above the leveling scale with the words LEVEL HERE.
 - (b) The plumb bob cord must be on the outboard side (decal) of the support bracket.
 - (c) Make sure that the plumb bob is clear of the target by less than 1/8 in. (3.18 mm).

SUBTASK 08-20-02-580-002

- (2) Make sure that the airplane is level.
 - (a) Let the plumb bob be stable where it does not move.
 - (b) Look to see the position of the plumb bob.
 - (c) If the plumb bob does not show a zero position on the leveling scale, make the airplane level.

SUBTASK 08-20-02-580-003

- (3) Make the airplane level with the nose and main landing gear.



WARNING

DO NOT INFLATE THE SHOCK STRUT TO MORE THAN THE LIMIT. IF YOU INFLATE THE SHOCK STRUT TO MORE THAN THE LIMIT, INJURIES TO PERSONNEL CAN OCCUR. DAMAGE TO THE NOSE LANDING GEAR CAN ALSO OCCUR.

- (a) Inflate or deflate the nose and main landing gear shock struts until the plumb bob or inclinometers show zero degrees.

NOTE: For the inclinometers, zero degree position (airplane level) is position "K" for pitch inclinometer and position "10" for roll inclinometer.

NOTE: Change the direction of the roll first to make the airplane level.

- 1) Adjust the shocks on the main landing gear, do this task: Main Landing Gear Shock Strut Servicing, Airplane on the Ground, TASK 12-15-31-610-802.
- 2) Adjust the shocks on the nose landing gear, do this task: Nose Landing Gear Shock Strut Servicing, Airplane on the Ground, TASK 12-15-41-610-802.
- 3) Make sure that the plumb bob or inclinometers show zero degrees.
- 4) Put the airplane on jacks if you cannot make the airplane level on the landing gear.

SUBTASK 08-20-02-580-004

- (4) Lift the airplane on jacks until the inclinometer or plumb bob show zero degrees.

NOTE: The jacks must have pressure gages and a conversion table to give the pounds of load at each jack point.

NOTE: If you weigh the airplane, do not use the inclinometer to make sure that the airplane is level.



CAUTION

MAKE SURE THAT YOU RELEASE THE PARKING BRAKE BEFORE YOU LIFT OR LOWER THE AIRPLANE WITH JACKS. IF YOU DO NOT OBEY, DAMAGE TO THE AIRPLANE AND EQUIPMENT CAN OCCUR.

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(CAUTION PRECEDES)



CAUTION

MAKE SURE THAT YOU REMOVE THE WHEEL CHOCKS BEFORE YOU LIFT OR LOWER THE AIRPLANE WITH JACKS. IF YOU DO NOT REMOVE BLOCKAGES AROUND THE MAIN LANDING GEAR, DAMAGE TO THE AIRPLANE AND EQUIPMENT CAN OCCUR.

- (a) Do this task: Lift the Airplane on Jacks, TASK 07-10-01-580-801.
- (b) Lift or lower the jacks until the plumb bob is at zero degrees on the leveling scale.

F. Put the Airplane Back to Its Usual Condition

SUBTASK 08-20-02-840-001



WARNING

MAKE SURE THAT ALL PERSONNEL AND EQUIPMENT ARE AWAY FROM THE AREA AROUND THE LANDING GEAR. IF THE LANDING GEAR MOVES, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.



CAUTION

MAKE SURE THAT YOU RELEASE THE PARKING BRAKE BEFORE YOU LIFT OR LOWER THE AIRPLANE WITH JACKS. IF YOU DO NOT OBEY, DAMAGE TO THE AIRPLANE AND EQUIPMENT CAN OCCUR.



CAUTION

MAKE SURE THAT YOU REMOVE THE WHEEL CHOCKS BEFORE YOU LIFT OR LOWER THE AIRPLANE WITH JACKS. IF YOU DO NOT REMOVE BLOCKAGES AROUND THE MAIN LANDING GEAR, DAMAGE TO THE AIRPLANE AND EQUIPMENT CAN OCCUR.

- (1) Do this task: Lower the Airplane off Jacks, TASK 07-10-01-580-802.

SUBTASK 08-20-02-410-001

- (2) Close the landing gear doors.

———— **END OF TASK** ————

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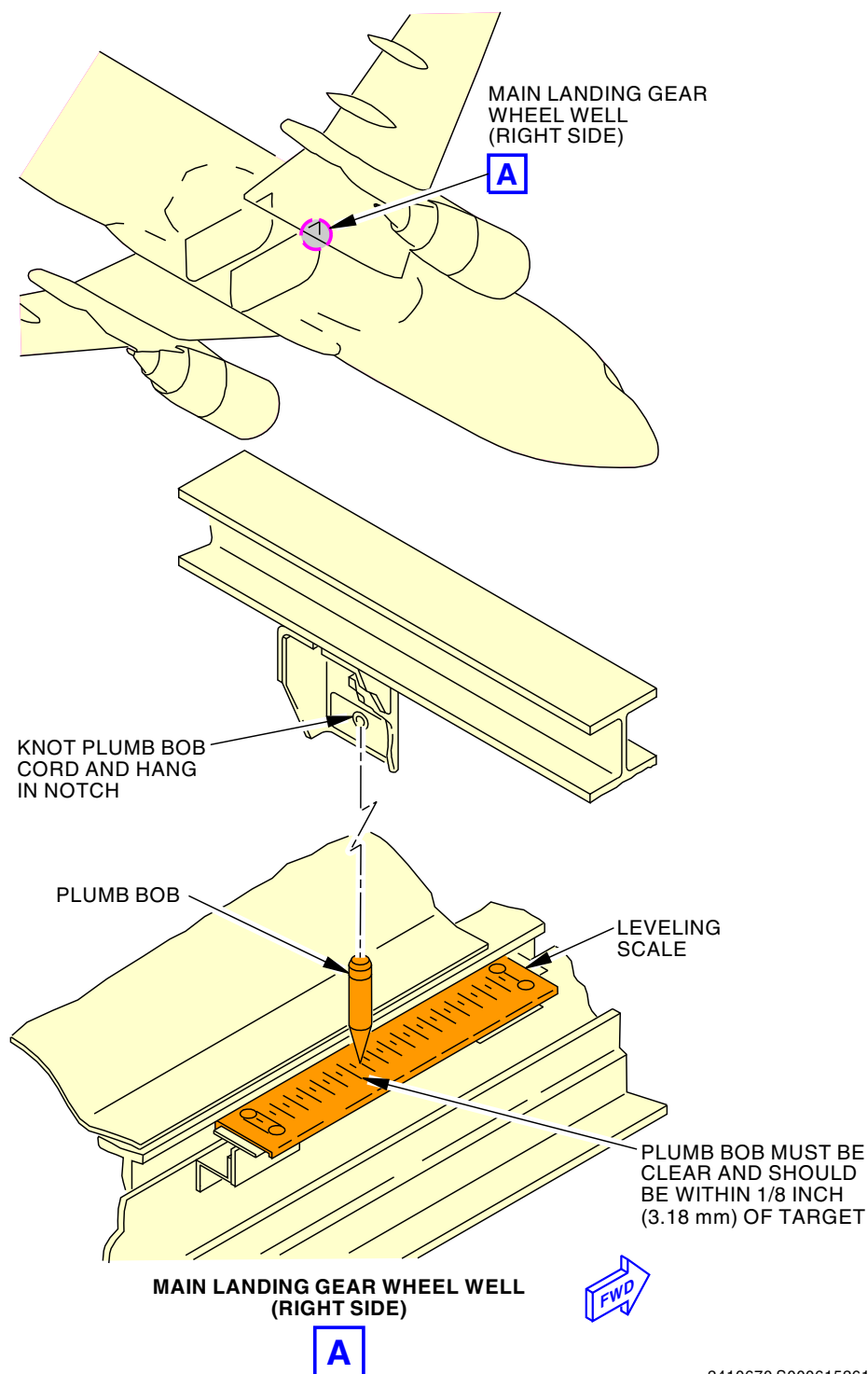
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Level the Airplane with Plumb Bob
Figure 201/08-20-02-990-801

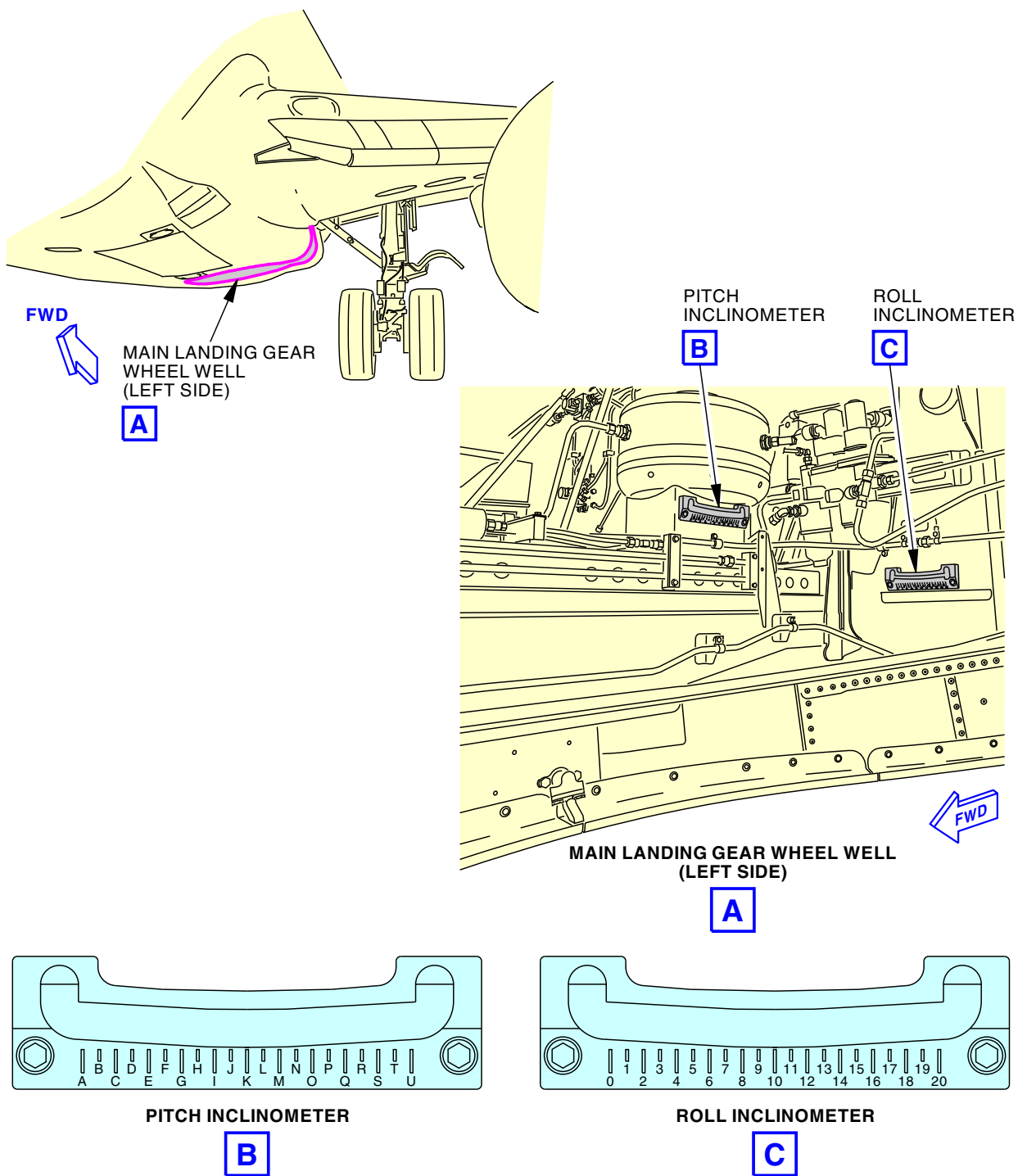
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Level the Airplane with Inclinometers
Figure 202/08-20-02-990-802

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LEVEL AIRPLANE WITH A ATTITUDE GAGE - MAINTENANCE PRACTICES

1. General

- A. This procedure has this task:
- (1) Level the Airplane With a Attitude Gage.
- B. The attitude gage finds the degree of pitch or roll of the airplane on the ground. Hold the probe parallel or at a right angle to the airplane centerline. The alignment tubes on the attitude gage must be put on the flat ceiling support beam in the wheel well.

TASK 08-20-03-580-801

2. Level the Airplane With a Attitude Gage

(Figure 201)

A. General

- (1) Do this procedure to level the airplane or to put the airplane on jacks to do the procedures that follow:
 - (a) Weigh the airplane.
 - (b) Do general airplane maintenance.
 - (c) Do the landing gear retraction tests.

B. References

Reference	Title
07-10-01-580-801	Lift the Airplane on Jacks (P/B 201)
07-10-01-580-802	Lower the Airplane off Jacks (P/B 201)
10-11-01-580-801	Airplane Parking (P/B 201)
12-15-31-610-802	Main Landing Gear Shock Strut Servicing, Airplane on the Ground (P/B 301)
12-15-41-610-802	Nose Landing Gear Shock Strut Servicing, Airplane on the Ground (P/B 301)
32-00-01-080-801	Landing Gear Downlock Pins Removal (P/B 201)
32-00-01-480-801	Landing Gear Downlock Pins Installation (P/B 201)

C. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
SPL-1497	Gauge - Attitude, Airplane Part #: 21465A82 Supplier: 3A054 Part #: KS5549 Supplier: 75245 Part #: KS6005 Supplier: 75245 Opt Part #: F70043 Supplier: 81205

D. Location Zones

Zone	Area
740	Subzone - Right Main Landing Gear and Landing Gear Doors

E. Prepare to Level the Airplane

SUBTASK 08-20-03-840-001

- (1) Park the airplane where the ground is as level as possible.

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- (a) Do this task: Airplane Parking, TASK 10-11-01-580-801.

NOTE: The airplane must be parked on a level surface to do this procedure.

SUBTASK 08-20-03-480-001



MAKE SURE THE DOWNLOCK PINS ARE INSTALLED ON ALL THE LANDING GEAR. WITHOUT THE DOWNLOCK PINS, THE LANDING GEAR COULD RETRACT AND CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (2) Install the nose and main landing gear downlock pins.

- (a) Do this task: Landing Gear Downlock Pins Installation, TASK 32-00-01-480-801.

F. Level the Airplane Procedure

SUBTASK 08-20-03-580-001

- (1) Use a gauge, SPL-1497 to see if the airplane is level in the roll direction.

NOTE: Make sure that the airplane is leveled in the lateral (roll) direction first. If the airplane is leveled laterally first, it should not need re-leveling after the longitudinal leveling is done.

- (a) Put the gauge, SPL-1497 parallel to the airplane centerline.
(b) Make sure that the alignment tube ends are on a flat surface of the wheel well ceiling.
(c) On the top of the attitude gage, turn the screw adjuster until the pointer is on zero.

NOTE: If the bubble is not in the center of the vial, you must lift or lower the sides of the airplane. The bubble will move to the high side of the airplane.

SUBTASK 08-20-03-580-002

- (2) Make the airplane level with the nose and main landing gear.



DO NOT INFLATE THE SHOCK STRUT TO MORE THAN THE LIMIT. IF YOU INFLATE THE SHOCK STRUT TO MORE THAN THE LIMIT, INJURIES TO PERSONNEL CAN OCCUR. DAMAGE TO THE NOSE LANDING GEAR CAN ALSO OCCUR.

- (a) Adjust the shock struts to make the airplane level. Inflate or deflate the nose and main landing gear shock struts.

NOTE: Change the direction of the roll first to make the airplane level.

- 1) Adjust the shocks on the main landing gear, do this task: Main Landing Gear Shock Strut Servicing, Airplane on the Ground, TASK 12-15-31-610-802.
- 2) Make sure that the plumb bob or inclinometers show zero degrees.
- 3) Adjust the shocks on the nose landing gear, do this task: Nose Landing Gear Shock Strut Servicing, Airplane on the Ground, TASK 12-15-41-610-802.
- 4) Make sure that the plumb bob or inclinometers show zero degrees.
- 5) Put the airplane on jacks if you cannot make the airplane level on the landing gear.

SUBTASK 08-20-03-580-003

- (3) Lift the airplane on jacks until the inclinometer or plumb bob show zero degrees.

NOTE: The jacks must have pressure gages and a conversion table to give the pounds of load at each jack point.

NOTE: If you weigh the airplane, do not use the inclinometer to make sure that the airplane is level.

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MAKE SURE THAT YOU RELEASE THE PARKING BRAKE BEFORE YOU LIFT OR LOWER THE AIRPLANE WITH JACKS. IF YOU DO NOT OBEY, DAMAGE TO THE AIRPLANE AND EQUIPMENT CAN OCCUR.



MAKE SURE THAT YOU REMOVE THE WHEEL CHOCKS BEFORE YOU LIFT OR LOWER THE AIRPLANE WITH JACKS. IF YOU DO NOT REMOVE BLOCKAGES AROUND THE MAIN LANDING GEAR, DAMAGE TO THE AIRPLANE AND EQUIPMENT CAN OCCUR.

- (a) Do this task: Lift the Airplane on Jacks, TASK 07-10-01-580-801.
- (b) Lift or lower the jacks until the plumb bob is at zero degrees on the leveling scale.

SUBTASK 08-20-03-580-004

- (4) Do the longitudinal and lateral leveling procedures again until the bubble shows zero degrees in each position.

G. Put the Airplane Back to its Usual Condition

SUBTASK 08-20-03-840-002



MAKE SURE THAT YOU RELEASE THE PARKING BRAKE BEFORE YOU LIFT OR LOWER THE AIRPLANE WITH JACKS. IF YOU DO NOT OBEY, DAMAGE TO THE AIRPLANE AND EQUIPMENT CAN OCCUR.



MAKE SURE THAT YOU REMOVE THE WHEEL CHOCKS BEFORE YOU LIFT OR LOWER THE AIRPLANE WITH JACKS. IF YOU DO NOT REMOVE BLOCKAGES AROUND THE MAIN LANDING GEAR, DAMAGE TO THE AIRPLANE AND EQUIPMENT CAN OCCUR.



MAKE SURE THAT ALL PERSONNEL AND EQUIPMENT ARE AWAY FROM THE AREA AROUND THE LANDING GEAR. IF THE LANDING GEAR MOVES, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

- (1) Do this task: Lower the Airplane off Jacks, TASK 07-10-01-580-802.

SUBTASK 08-20-03-080-001

- (2) Remove the landing gear downlock pins, if necessary.
 - (a) Do this task: Landing Gear Downlock Pins Removal, TASK 32-00-01-080-801.

————— **END OF TASK** —————

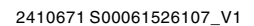
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Level the Airplane With a Attitude Gage



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INCLINOMETER - REMOVAL/INSTALLATION

1. General

- A. The airplane is supplied with one lateral and longitudinal inclinometer. The inclinometers are located in the main landing gear wheel well.
- B. This procedure has these two tasks:
 - (1) Inclinometer Removal
 - (2) Inclinometer Installation

TASK 08-20-04-000-801

2. Inclinometer Removal

(Figure 401)

A. General

- (1) There are two inclinometers installed in the left main gear wheel well.

B. Remove the Inclinometer Procedure

SUBTASK 08-20-04-010-001

- (1) Open the landing gear access doors.

SUBTASK 08-20-04-020-001

- (2) Remove the lateral (roll) inclinometer.
 - (a) Remove the two washers and screws that attach the inclinometer to the structure.
 - (b) Remove the inclinometer.

SUBTASK 08-20-04-020-002

- (3) Remove the longitudinal (pitch) inclinometer.
 - (a) Remove the two washers and screws that attach the inclinometer to the structure.
 - (b) Remove the inclinometer.

———— **END OF TASK** ————

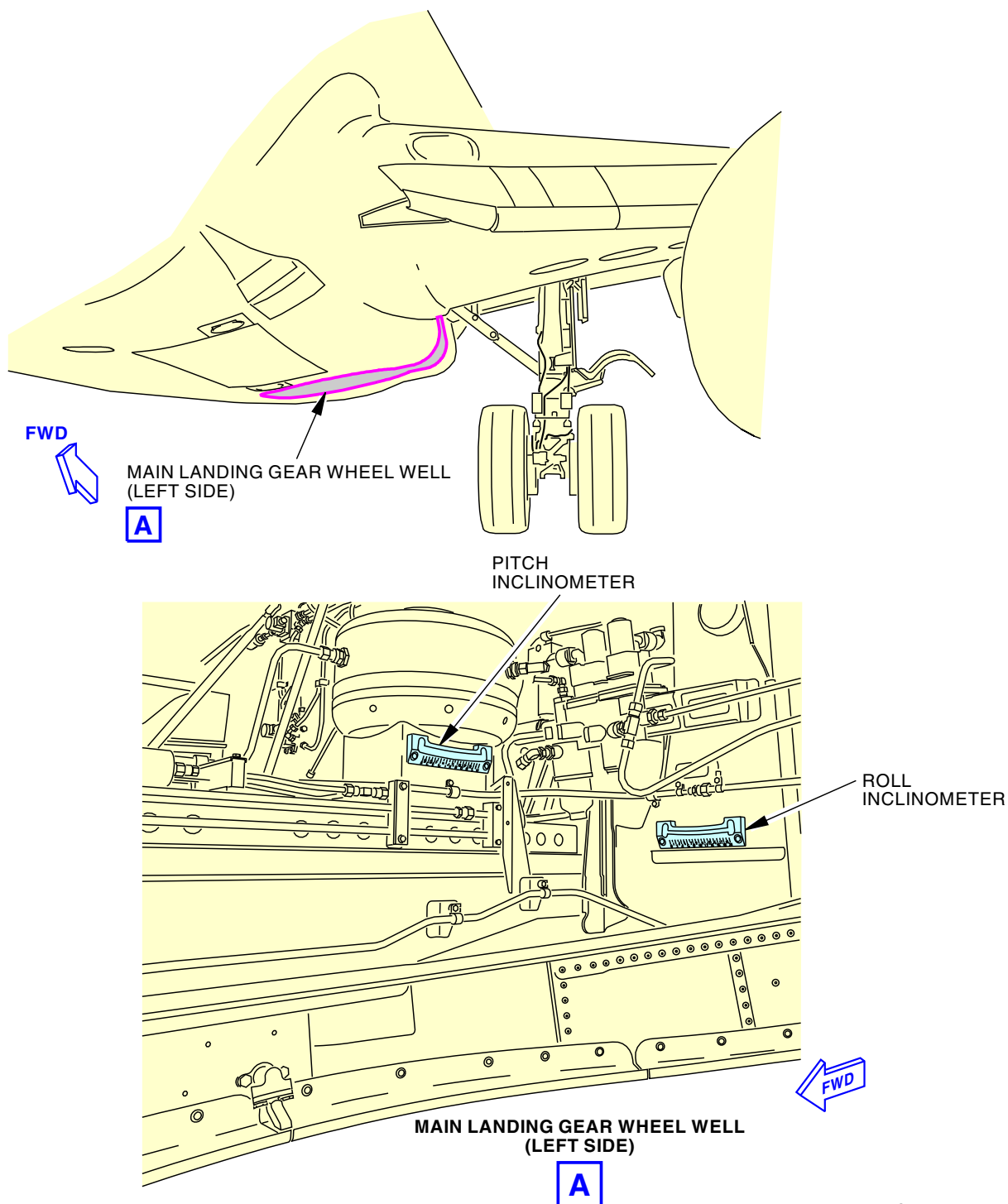
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Inclinometer Installation
Figure 401/08-20-04-990-802

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TASK 08-20-04-400-801

3. Inclinometer Installation

(Figure 401)

A. References

Reference	Title
08-20-02-580-801	Level the Airplane With a Plumb Bob and Inclinometers (P/B 201)
10-11-01-580-801	Airplane Parking (P/B 201)

B. Prepare for Installation

SUBTASK 08-20-04-580-001

- (1) Park the airplane in the most level position available.
 - (a) Do this task: Airplane Parking, TASK 10-11-01-580-801.

SUBTASK 08-20-04-580-002

- (2) Level the airplane.
 - (a) Level the airplane laterally (roll direction) first.
 - (b) Do this task: Level the Airplane With a Plumb Bob and Inclinometers, TASK 08-20-02-580-801.

C. Install the Inclinometer Procedure

SUBTASK 08-20-04-010-002

- (1) Open the landing gear access doors.

SUBTASK 08-20-04-420-001

- (2) Install the lateral (roll) inclinometer.

NOTE: It may be necessary to lightly tap on the top of the inclinometer to center the ball properly.

 - (a) Align the inclinometer on the structure. Make sure that the leveling bubble is centered.
 - (b) Install the two washers and screws to attach the inclinometer to the structure.

SUBTASK 08-20-04-010-003

- (3) Install the longitudinal (pitch) inclinometer.

NOTE: It may be necessary to lightly tap on the top of the inclinometer to center the ball properly.

 - (a) Align the inclinometer on the structure. Make sure that the leveling bubble is centered.
 - (b) Install the two washers and screws to attach the inclinometer to the structure.

D. Put the Airplane Back to its Usual Condition

SUBTASK 08-20-04-410-001

- (1) Close the landing gear access doors.

————— **END OF TASK** —————

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