

CHAPTER

08

**LEVELING AND
WEIGHING**



**737-600/700/800/900
AIRCRAFT MAINTENANCE MANUAL**

**CHAPTER 08
LEVELING AND WEIGHING**

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WEIGHING - MAINTENANCE PRACTICES

1. General

A. This procedure has a task which gives information on the procedures you use to weigh the airplane.

TASK 08-11-00-580-801

2. Procedures to Weigh the Airplane

A. 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-1871	Retention Straps - Shock Strut, NLG/MLG Part #: C32030 -31 Supplier: 81205 Opt Part #: C32030-10 Supplier: 81205

B. Procedure

SUBTASK 08-11-00-580-001

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

NOTE: You can weigh the airplane with the three equally accurate procedures that follow:

- Weigh at the landing gear wheels with a set of floor scales.
- Weigh at the main landing gear and nose landing gear axle jack points.
- Weigh at the wing and aft body jack points.

You can weigh the airplane faster with the first procedure above than with procedures in which jacks are necessary. The second step above is better than the third step because there is less chance of structural damage to the airplane through failure of a support jack or weigh cell. The second step above is more economical and faster than the third step because installation of oleo locks (retention strap, SPL-1871) is not necessary.

———— **END OF TASK** ————

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LEVEL AIRPLANE WITH A PLUMB BOB AND INCLINOMETERS - MAINTENANCE PRACTICES

1. General

- A. This procedure contains the following task:
- (1) Level the airplane with a plumb bob and inclinometers.
- B. The airplane has two types of leveling indicators in the wheel well of the right body landing gear. 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 08-21-02-580-801

2. Level the Airplane With a Plumb Bob and Inclinometers

(Figure 201, Figure 202)

A. General

- (1) Do this task when you jack the airplane to do any of the procedures that follow:
 - (a) Weigh the airplane.
 - (b) Do general airplane maintenance.
 - (c) Do gear retraction tests.

B. References

Reference	Title
07-11-01-580-815	Lift the Airplane with the Jacks (P/B 201)
07-11-01-580-816	Lower the Airplane Off the Jacks (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 08-21-02-580-002

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

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

SUBTASK 08-21-02-800-001



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

- (2) If the downlock pins are not installed, do this task: Landing Gear Downlock Pins Installation, TASK 32-00-01-480-801.

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E. Level the Airplane With a Plumb Bob and Inclinometers

SUBTASK 08-21-02-480-002

- (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 $\frac{1}{8}$ in. (3.18 mm).

SUBTASK 08-21-02-580-003

- (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 08-21-02-580-004

- (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 (TASK 12-15-31-610-802).
 - 2) Adjust the shocks on the nose landing gear (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 08-21-02-580-005

- (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.



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 with the Jacks, TASK 07-11-01-580-815.

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- (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 08-21-02-840-001



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.



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.

- (1) Lower the airplane off of the jacks (TASK 07-11-01-580-816).

————— **END OF TASK** —————

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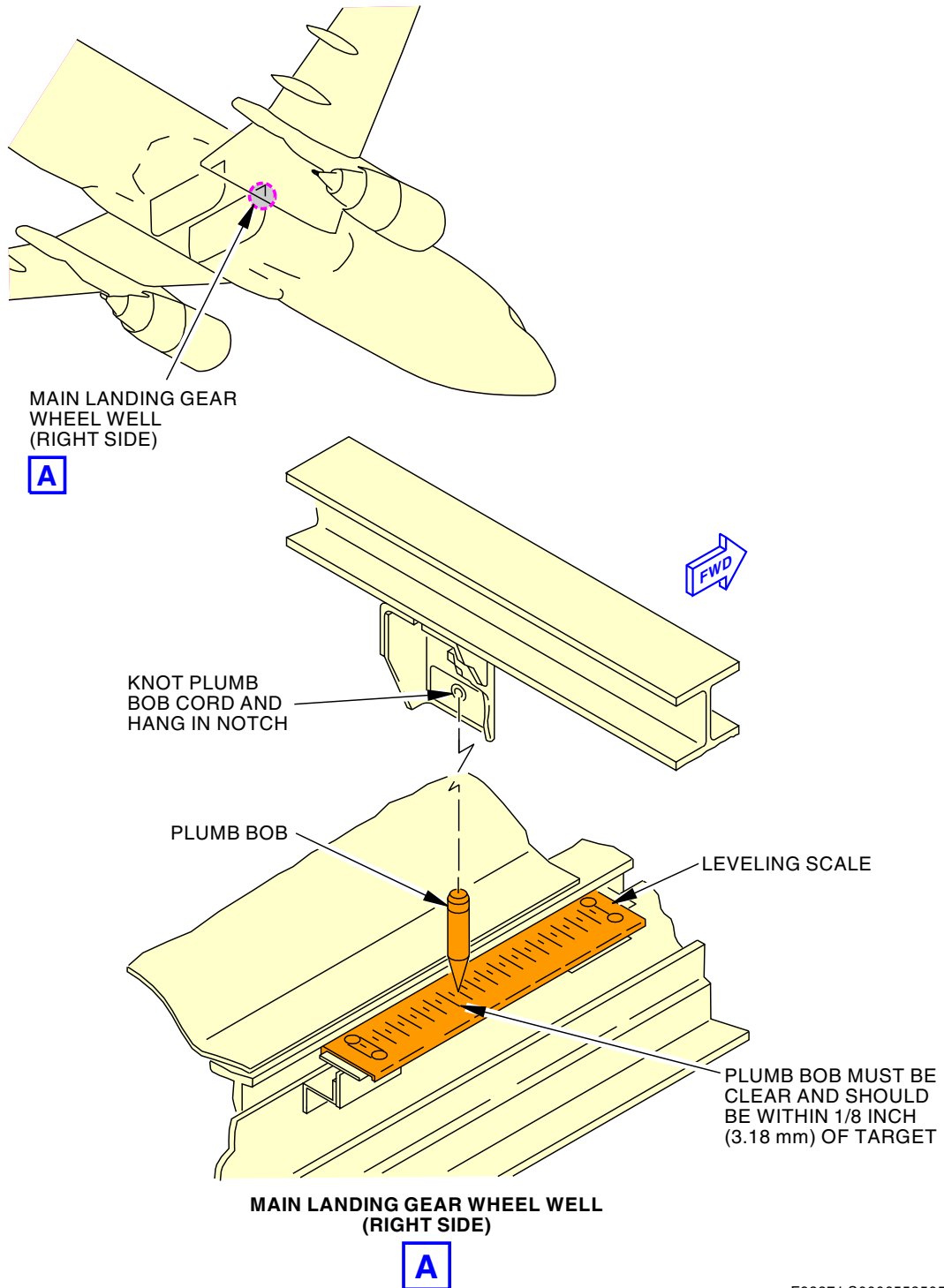
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Airplane Leveling with Plumb Bob
Figure 201/08-21-02-990-802

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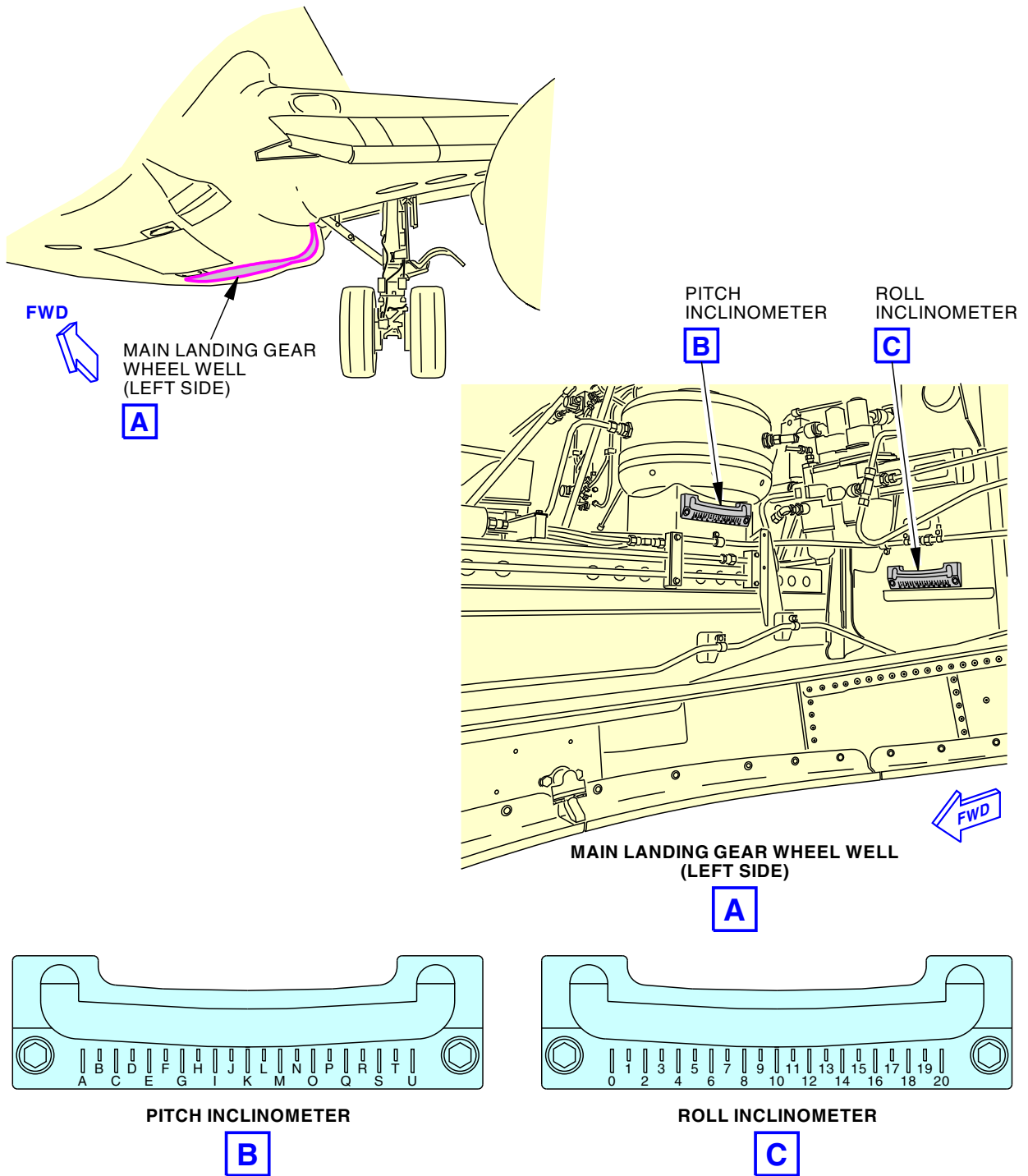
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Airplane Leveling with Inclinometers
Figure 202/08-21-02-990-803

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LEVEL AIRPLANE WITH THE ATTITUDE GAGE - MAINTENANCE PRACTICES

1. General

- A. This procedure has a task to make the airplane level with an attitude gage.
- B. Do this task when you jack the airplane to do any of the procedures that follow:
 - (1) Weigh the airplane,
 - (2) General airplane maintenance,
 - (3) Gear retraction tests.

TASK 08-21-03-580-801

2. Make the Airplane Level

A. References

Reference	Title
07-11-01-580-815	Lift the Airplane with the Jacks (P/B 201)
07-11-01-580-816	Lower the Airplane Off the Jacks (P/B 201)
10-11-03-580-802	Prepare the Airplane to be Parked in High Winds - Preferred Configuration (P/B 201)
12-15-31-610-802	Main Landing Gear Shock Strut Servicing, Airplane on the Ground (P/B 301)

B. 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 #: F70043-26 Supplier: 81205 Part #: KS5549 Supplier: 75245 Part #: KS6005 Supplier: 75245 Opt Part #: F70043 Supplier: 81205

C. Location Zones

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

D. Level the Airplane

SUBTASK 08-21-03-580-001

- (1) Do this task: (Prepare the Airplane to be Parked in High Winds - Preferred Configuration, TASK 10-11-03-580-802).
 - (a) Make sure the airplane is parked in the most level position available.

SUBTASK 08-21-03-480-001

- (2) Do the steps that follow to level the airplane (Figure 201), using gauge, SPL-1497.

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

- (a) Put the gauge, SPL-1497, perpendicular to the airplane centerline to see if the airplane is level in the roll direction.

NOTE: Make sure the alignment tube ends are on a flat surface of the wheel well ceiling.

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- (b) Set the screw adjuster on top of the attitude gage 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 as it is necessary. The bubble will move to the high side of the airplane.

- (c) Do these steps to make the airplane level about its roll axis:



DO NOT PRESSURIZE THE SHOCK STRUTS TO MORE THAN THE USUAL SERVICING PRESSURE. IF YOU DO NOT OBEY, INJURY TO PERSONNEL AND DAMAGE TO SHOCK STRUTS CAN OCCUR.

- 1) For small adjustments, do this step:
- a) Extend or retract the main landing gear shock struts to usual service band limits, do this task: (Main Landing Gear Shock Strut Servicing, Airplane on the Ground, TASK 12-15-31-610-802).



ALL OF THE JACKS MUST HAVE PRESSURE GAGES. DO NOT USE MORE PRESSURE THAN THE PERMITTED LIMITS. IF YOU DO NOT OBEY THESE INSTRUCTIONS, DAMAGE TO EQUIPMENT CAN OCCUR.

- (d) For large adjustments, do these steps:
- 1) Put the applicable jack pad adapters and jacks at jacking points A and B, do this task: (Lift the Airplane with the Jacks, TASK 07-11-01-580-815).
- 2) Lift or lower the jacks until the bubble is in the center of the vial.
- (e) Put the alignment tube tips of the attitude gage against the ceiling in the main wheel well.
- (f) Put the gage parallel to the airplane centerline to see if the airplane is level about the longitudinal axis.
- NOTE: Make sure the alignment tube tips are on a flat surface of the wheel well ceiling.
- (g) Set the screw adjuster on top of the attitude gage until the pointer is on zero.
- NOTE: If the bubble is not in the center of the vial, you must lift or lower the airplane as it is necessary. The bubble will move to the high end of the airplane.
- (h) Do these steps to make the airplane level about its longitudinal axis:



DO NOT PRESSURIZE THE SHOCK STRUTS TO MORE THAN THE USUAL SERVICING PRESSURE. IF YOU DO NOT OBEY, INJURY TO PERSONNEL AND DAMAGE TO SHOCK STRUTS CAN OCCUR.

- 1) For small adjustments, do this step:
- a) Extend or retract the main and nose landing gear shock struts to usual service band limits, do this task: (Main Landing Gear Shock Strut Servicing, Airplane on the Ground, TASK 12-15-31-610-802).



ALL OF THE JACKS MUST HAVE PRESSURE GAGES. DO NOT USE MORE PRESSURE THAN THE PERMITTED LIMITS. IF YOU DO NOT OBEY THESE INSTRUCTIONS, DAMAGE TO EQUIPMENT CAN OCCUR.

- 2) For large adjustments, do these steps:
- a) Put the applicable jack pad adapter and jack at jacking point C, do this task: (Lift the Airplane with the Jacks, TASK 07-11-01-580-815).

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- b) Lift or lower the jack until the bubble is in the center of the vial.
- (i) Do the longitudinal and lateral leveling procedures again until the bubble is in the center in each position.

E. Put the Airplane Back to It's Initial Condition

SUBTASK 08-21-03-820-001

- (1) If it is necessary, lower the airplane off of the jacks, do this task: (Lower the Airplane Off the Jacks, TASK 07-11-01-580-816).

———— **END OF TASK** ————

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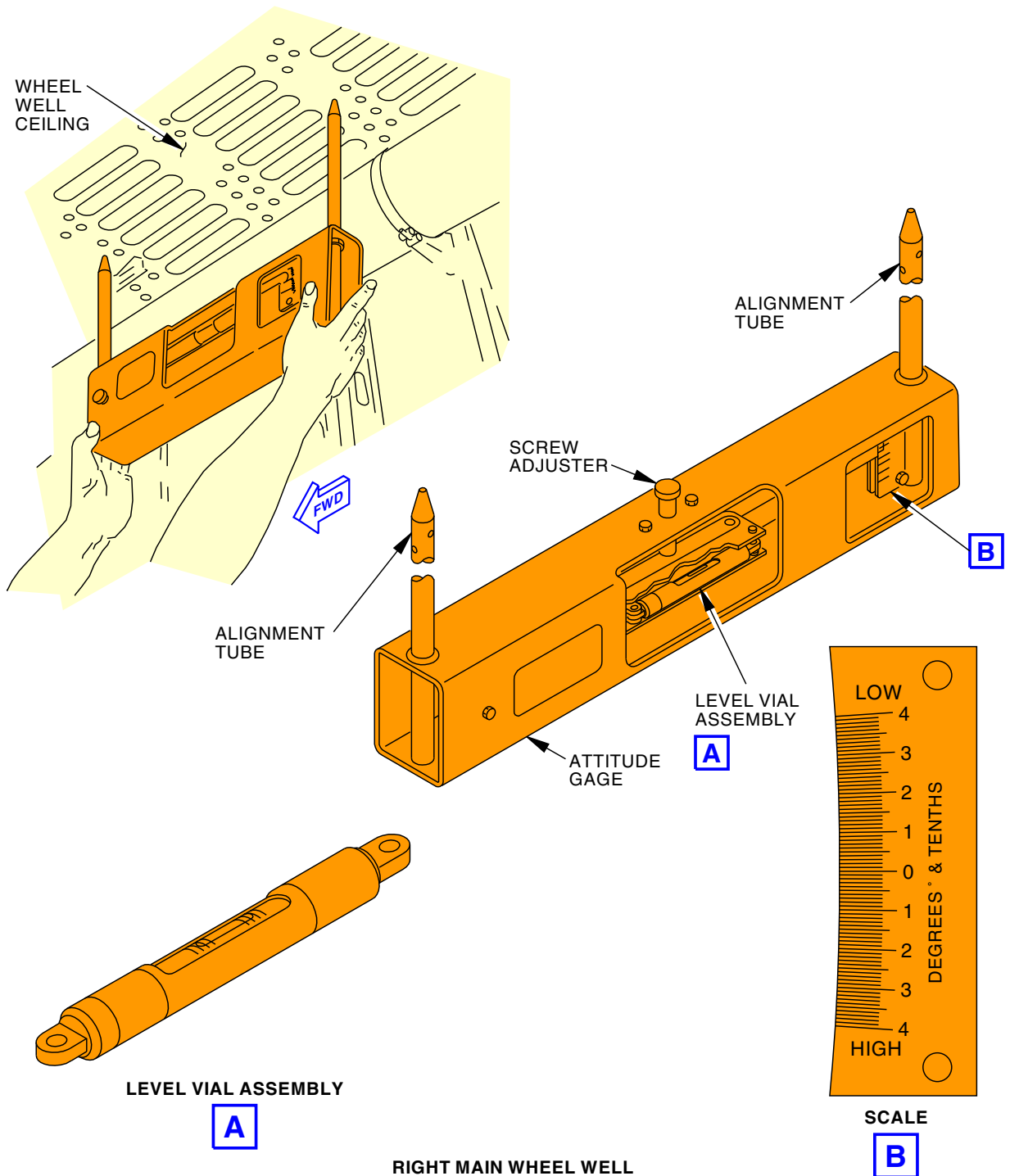
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Airplane Leveling Using Attitude Gage
Figure 201/08-21-03-990-801

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INCLINOMETER - REMOVAL/INSTALLATION

1. General

- A. The airplane is supplied with one lateral and one longitudinal inclinometer. The inclinometers are located in the main landing gear wheel well.
- B. This procedure contains two tasks. There is one task for removal of lateral/longitudinal inclinometer. There is one task for installation of lateral/longitudinal inclinometer.

TASK 08-21-04-000-801

2. Inclinometer - Removal

A. Procedure

SUBTASK 08-21-04-010-001

- (1) Gain access to the applicable inclinometer in the left main landing gear wheel well.

SUBTASK 08-21-04-020-001

- (2) Remove a screw and washer from each end of the inclinometer.

SUBTASK 08-21-04-020-002

- (3) Remove the inclinometer.

————— **END OF TASK** —————

TASK 08-21-04-400-801

3. Inclinometer - Installation

A. References

Reference	Title
08-21-02-580-801	Level the Airplane With a Plumb Bob and Inclinometers (P/B 201)
10-11-01-580-801	Airplane Parking (P/B 201)

B. Procedure

SUBTASK 08-21-04-860-001

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

SUBTASK 08-21-04-860-002

- (2) Do this task: Level the Airplane With a Plumb Bob and Inclinometers, TASK 08-21-02-580-801.

SUBTASK 08-21-04-420-001

- (3) With airplane leveled, install the lateral/longitudinal inclinometer with the ball at the null point (center of scale).

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

SUBTASK 08-21-04-420-002

- (4) Install the washer and screw at each end of the inclinometer.
 - (a) Make sure that the leveling bubble in the inclinometer is centered before you tighten the screws.

SUBTASK 08-21-04-840-001

- (5) Restore the airplane to normal.

————— **END OF TASK** —————

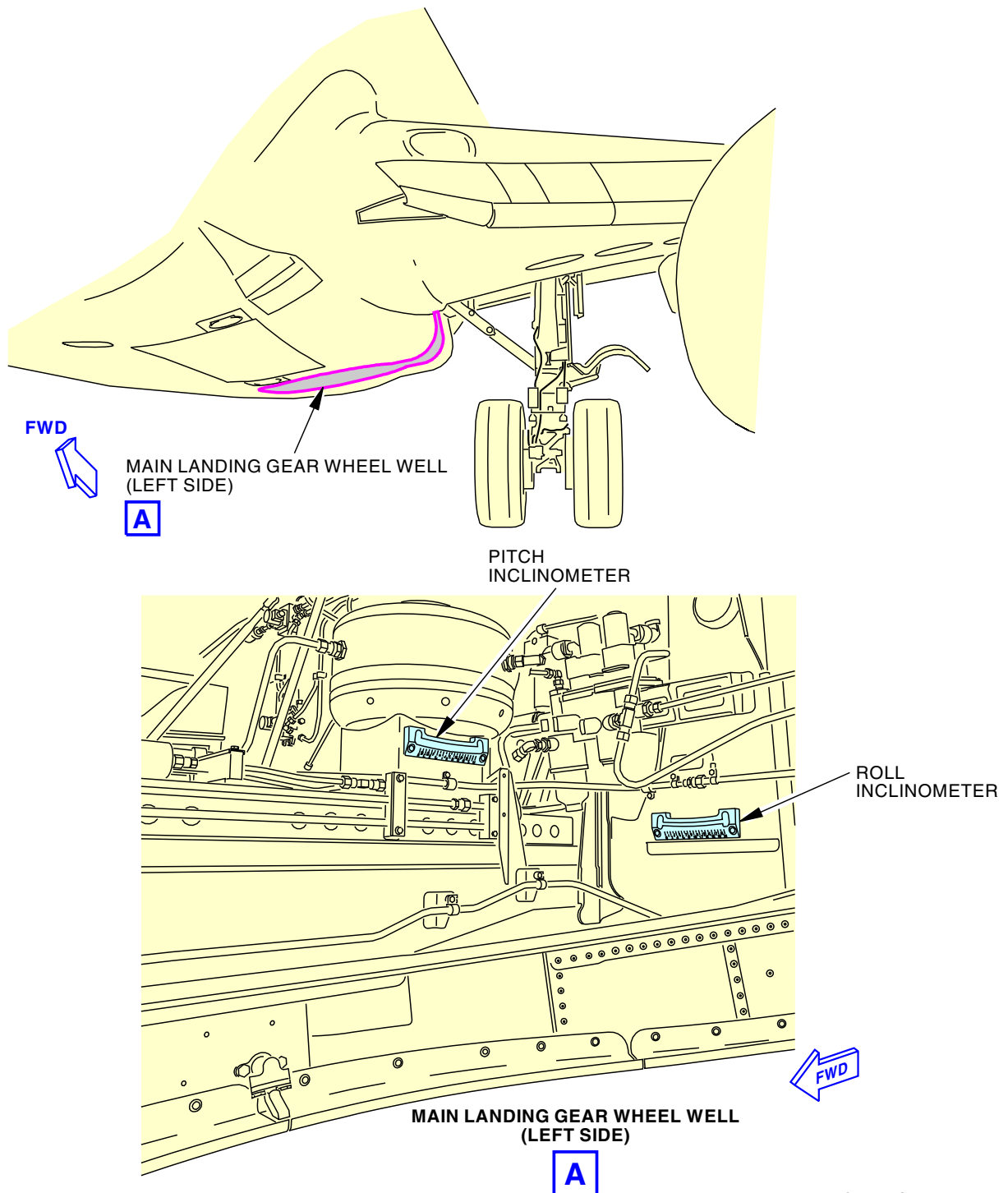
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Inclinometer Installation
Figure 401/08-21-04-990-801

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