



# ANAC

Administración Nacional  
de Aviación Civil

## ADVERTENCIA 193/DAG

La presente ADVERTENCIA tiene por objeto dar a conocer una situación que puede resultar de interés para Talleres Aeronáuticos de Reparación, operadores y/o propietarios de aeronaves, por tal motivo la misma se emite a los efectos de informar, y las recomendaciones en ella contenidas no tienen carácter mandatorio.

Ciudad Autónoma de Buenos Aires, 24 de mayo de 2016.

### **DIRIGIDO A:**

Talleres Aeronáuticos de Reparación con alcance para aeronaves PA-12.

### **MOTIVO:**

Procedimiento correcto para realizar el NIVELADO y el REGLAJE de las aeronaves Piper PA-12.

### **ANTECEDENTES:**

En abril de 2016, durante el proceso de reparación de una aeronave Piper PA-12, se verificó la imposibilidad de seguir el procedimiento desarrollado por PIPER para la nivelación y el reglaje de esta aeronave. El procedimiento original está indicado en el Service Memo No. 8, del que se adjunta una copia en el ANEXO 1. El mismo indica que para el nivelado del PA-12, se debe colocar una PLOMADA desde el orificio ubicado en la parte inferior del tramo superior del marco de la puerta y a 4.5 pulgadas delante del parante trasero del marco, y ajustar los gatos hasta que la plomada coincida con el orificio existente en una placa metálica ubicada debajo del asiento trasero, en el lado derecho del mismo. En la aeronave inspeccionada no fue posible ubicar el orificio del marco de la puerta ni la placa metálica debajo del asiento.

La FAA AC 43-16 de agosto de 1997, incluye una Alerta titulada ALTERNATIVE LEVELING MEANS AND RIGGING OF WING WASHOUT FOR PIPER PA-12, PA-12S, PA-14, PA-18 SERIES, AND PA-19 AIRPLANES, cuyo contenido que puede ser usado como complemento de la información de Piper para la nivelación y el reglaje de varios modelos de aeronaves Piper. Dicho documento cuenta con la aprobación de la FAA, según indica la mencionada Alerta.

El ANEXO 2 contiene una copia del contenido de dicha Alerta, Páginas 10 a la 13 de la FAA AC arriba mencionada, y el ANEXO 3 contiene una traducción del método alternativo, únicamente para las aeronaves Piper PA-12, para su nivelación y el ajuste de la TORSIÓN GEOMETRICA de sus semiplanos.

### **RECOMENDACIÓN:**

En aquellas aeronaves Piper PA-12 en las que no se pueden encontrar las marcas de nivelación originales, se recomienda nivelar el avión (PASO I del Service Memo No. 8) y ajustar la torsión geométrica del ala (PASO 3 del Service Memo No. 8), mediante los puntos 1, 2 y 3 del SUPLEMENTO contenido en el ANEXO 3.

**Ing. Aer. Gustavo SMIRIGLIA**  
Jefe Departamento Aviación General  
Dirección de Aeronavegabilidad

## ANEXO 1

# SERVICE

# MEMO

Service Memo No. 8

### MODEL PA-12 RIGGING PROCEDURE

1. Leveling: Place adjustable jacks on blocks under the axle extension so that the jacks or blocks do not touch the brake lines or connections. Raise each wheel by pushing up on the lift struts on one side and pulling down on the opposite side. All lifting or pulling pressure must be applied as near to the wing attachment points as possible so as to be sure that the lift struts will not be bowed. Raise the tail to approximate level flight position and support it on an adjustable jack or block.

To level the airplane laterally and longitudinally, drop a plumb bob on a string from the hole located on the underside of the upper door frame member, 4-1/2 inches forward of the rear door frame member, to the hole in the metal plate located under the right side of the rear seat. Adjust the jacks or blocks until the plumb bob centers over this hole.

2. Dihedral Angle: Stretch a length of string from wing tip to wing tip along the top of the wing at the front spar location. Measure down from the string to the top of the fuselage front wing hinge fittings a distance of 3 inches. Adjust the front lift strut fork fittings in or out to produce this dimension.

To check for equal dihedral in each wing, use a 30 inch level held spanwise against the under side of the wing at the front spar location. Note the amount of off level on one wing and see if the other wing has the same amount of off level. Adjust the front lift strut forks in on one side and out on the other to get the same amount of off level in both wings. Check the 3 inch dimensions after this adjustment to see that it has not been affected by the equalizing adjustments.

3. Wash Out: Place a 1-3/8" block under the wing at the rear spar location at the outboard aileron rib. Place a 30 inch level chord wise across this block with the front end of the level at the front spar location. The bubble will center if the wing has the proper 2-1/2 degree washout. Adjust the rear lift strut forks in or out to bring the bubble to center.
4. Strut Alignment: Sight along the struts to see that they are not bowed. The jury strut eye bolt may be turned in or out of the fitting in the wing to raise or lower the center of the front lift strut. Adjustment of the jury struts, at the clamps, up or down the lift strut columns will raise or lower the rear lift strut and remove bow in or bow out.
5. Tail Assembly: Level the stabilizers at the rear spar with the airplane in level position. Sometimes it will be necessary to rig the stabilizers slightly off level to prevent binding of the screw adjusting mechanism. This condition should not exceed 1/2 inch up or down at the extreme ends of the stabilizers. Adjustment is accomplished by the tightening and loosening of the tail brace wires. Take up as many turns as the opposite wires are let out to keep the same tension on the wires. Do not scratch or mar the wires with pliers or wrenches as this may cause the wires to fracture. Plumb the rudder hinge line. Slight adjustments can be accomplished by firmly pushing against the fin rear spar in the direction required to bring the hinges in line. Check the rudder stops for proper adjustment.

## ANEXO 2

FAA AC 43-16

August 1997

aircraft. It was speculated that an engineering and/or a production problem led to this type of defect. This is an excellent area for your full attention during scheduled inspections. This report has been sent to the responsible FAA aircraft certification office for appropriate action.

Part total time-1,343 hours.

### LUSCOMBE

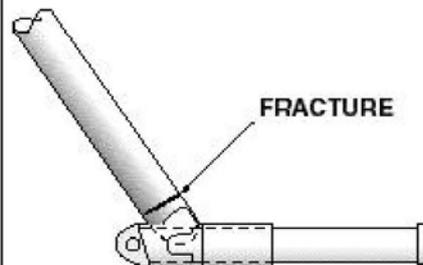
**Luscombe**                      **Landing Gear Failure**  
**Model LL-8-E**                      **3213**

Information for the following article was furnished by Mr. Darren Brown, who is an aviation safety inspector (airworthiness) with the FAA Flight Standards District Office located in Richmond, Virginia.

The pilot stated that during the afterlanding rollout, the left main landing gear collapsed.

An examination disclosed that the left main gear lower leg (P/N 58383) had broken. There was evidence of severe corrosion inside the bore of the lower gear leg at the point where it attached to the axle. (Refer to the following illustration.) It was speculated that approximately 70 percent of gear leg structure had been consumed by the effects of corrosion at the point of failure. It was believed the corrosion was caused by moisture and possible other contaminants entering the inner core of the gear leg through the landing gear fairing attachment bolt holes. This area is difficult to properly inspect due to the position of the gear fairing and the tie rod clevis. It was recommended this area be stripped of paint and inspected using dye penetrant to detect any cracks or pitting. It was also suggested that the strut be filled with linseed oil, allowed to soak for a time, and then drained. It would be wise to seal the landing gear fairings at the strut attachment holes.

Part total time-2,840 hours.



### PIPER

#### ALTERNATIVE LEVELING MEANS AND RIGGING OF WING WASHOUT FOR PIPER PA-12, PA-12S, PA-14, PA-18 SERIES, AND PA-19 AIRPLANES

The information contained in the following article was submitted by Mr. Gordon Mandell, who is an aeronautical engineer with the FAA Aircraft Certification Office, ACE-115N, located in Anchorage, Alaska.

This document has been approved by the FAA Aircraft Certification Office, ACE-117A, located in Atlanta, Georgia. ACE-117A is responsible for the Type Certificate Data Sheet for the airplanes listed. Piper will issue service information in the near future authorizing the use of this information.

This information is printed as it was approved by ACE-117A.

This document may be used to supplement the information contained in Piper Aircraft Corporation Service Memos No. 8, No. 9, and No. 19 concerning leveling and setting the wing washout of Piper Aircraft Corporation (now The New Piper Aircraft, Inc.) Models PA-12, PA-12S, PA-14, PA-18 Series, and PA-19 airplanes. This document is intended for use in cases where the airplane's original leveling marks cannot be found. It also contains information about setting the wing washout that is not found in the original Service Memos. For information concerning all other procedures for rigging the subject airplanes consult the original Service Memos.

**Piper Models PA-12, PA-12S, and PA-14**

1. If the original leveling marks cannot be found, the airplane can be leveled by deviating from Step 1 of Piper Aircraft Corporation Service Memo No. 8 for the PA-12 and PA-12S, or from Step 1 of Piper Aircraft Corporation Service Memo No. 9 for the PA-14, as follows:

Level the airplane laterally by placing an 18 inch spirit level on top of the member that supports the front edge of the rear seat and adjusting the heights of the jacks under the main landing gear axles to bring the bubble to center. Level the airplane longitudinally by placing an 18 inch spirit level on the cabin floor between the front and rear main landing gear attachment points. Position the level outboard of the front seat(s) on one side of the cabin, so that it is facing directly fore and aft, and place a 33/64 inch block under its rear end. Raise or lower the tail to bring the bubble to center. Repeat the procedure with the level positioned outboard of the front seat(s) on the other side of the cabin. If any difference in the tail height required to bring the bubble to center exists between the two sides, adjust the tail height so as to divide the difference evenly.

An 18 inch digital level may be substituted for the spirit level. If a digital level is used, level the airplane laterally by placing the level on top of the member that supports the front edge of the rear seat and adjusting the heights of the jacks under the main landing gear axles until the level reads zero. Level the airplane longitudinally by placing the level on the cabin floor between the front and rear main landing gear attachment points. Position the level outboard of the front seat(s) on one side of the cabin, so that it is facing directly fore and aft, and place it flat against the floor. Raise or lower the tail until the level reads not less than +1.6 degrees nor more than +1.7 degrees (front end of level higher than rear end). Then position the level outboard of the front seat(s) on the other side of the cabin, so that it is facing directly fore and aft, and place it flat against the floor. Observe the reading displayed by the level. If it is less than +1.6

degrees or more than +1.7 degrees, adjust the tail height until the average of the readings taken on the left and right sides of the cabin is between +1.6 degrees and +1.7 degrees (the actual value, expressed to the nearest thousandth of a degree, is +1.665 degrees, but most digital levels read to the nearest tenth of a degree).

2. Step 3 of Piper Service Memo No. 8 for the PA-12 and PA-12S, and Step 3 of Piper Service Memo No. 9 for the PA-14, both instruct the rigger (or two-person rigging crew) to set the wing washout after the airplane has been leveled, as follows:

Place a 1 3/8 inch block under one wing at the rear spar location at the outboard aileron rib. Place a 30 inch spirit level chordwise across this block with the front end of the level at the front spar location. Adjust the rear lift strut fork in or out to bring the bubble to center. When the bubble is centered the wing will have the proper 2 1/2 degree washout. Repeat the procedure for the other wing.

The following additional information pertains to this procedure:

a. The outboard aileron rib is the wing rib at the outboard end of the aileron bay. It is located 169 11/16 inches outboard of the butt rib.

b. A spirit level up to 48 inches long may be substituted for the 30 inch spirit level when setting the washout using the original method described in the Service Memos. The front end of the level must be placed at the front spar location regardless of the length of the level used. Excess length will extend aft past the 1 3/8 inch block.

c. A digital level 30 inches to 48 inches long may be substituted for the spirit level. If a digital level is used, place it chordwise under one wing at the outboard aileron rib, with the rear end of the level at the rear spar location. Excess length will extend forward past the front spar location. Adjust the rear lift strut fork in or out until the level reads -2.6 degrees

(front end of level lower than rear end). When the level reads -2.6 degrees (the actual value, expressed to the nearest thousandth of a degree, is -2.627 degrees, but most digital levels read to the nearest tenth of a degree) the wing will have the proper 2 1/2 degree washout. Repeat the procedure for the other wing.

d. Whether the washout is set by using a spirit level according to the original method described in the Service Memos or by using a digital level, the tolerance in the angle of incidence of the outboard aileron rib is +/- 1/4 of 1 degree. This is approximately equivalent to +/- 1/8 inch in the height of the 1 3/8 inch block used with the spirit level in the original method, or to +/- 0.2 degree in the reading of the digital level.

#### Piper PA-18 Model Series and PA-19

1. If the original leveling marks cannot be found, the airplane can be leveled by deviating from the "LEVELING" step of Piper Aircraft Corporation Service Memo No. 19 as follows:

Level the airplane laterally by placing an 18 inch spirit level on top of the member that supports the front edge of the rear seat and adjusting the heights of the jacks under the main landing gear axles to bring the bubble to center. Level the airplane longitudinally by placing an 18 inch spirit level on top of the bottom member of the door frame on the right side of the cabin, or by placing a spirit level up to 30 inches long along the lower window frame channel on the left side of the cabin. Raise or lower the tail to bring the bubble to center.

A digital level may be substituted for the spirit level. If a digital level is used, level the airplane laterally by placing the level on top of the member that supports the front edge of the rear seat and adjusting the heights of the jacks under the main landing gear axles until the level reads zero. Level the airplane longitudinally by placing an 18 inch digital level on top of the bottom member of the door frame on the right side of the cabin, or by placing a digital level up to 30 inches long

along the lower window frame channel on the left side of the cabin. Raise or lower the tail until the level reads zero.

2. The "WASH OUT" step of Piper Service Memo No.19 instructs the rigger (or two-person rigging crew) to set the wing washout after the airplane has been leveled, as follows:

Place a 3/8 inch spacer block on top of one end of a 30 inch spirit level. Place the level fore and aft along the bottom of the rib adjacent to the outer end of the aileron on one wing, with the spacer block at the rear of the level and the front end of the level at the front spar location. Adjust the rear lift strut fork in or out to bring the bubble to center. The correct washout will exist when the bubble is centered. Repeat the procedure for the other wing.

The following additional information pertains to this procedure:

a. The rib adjacent to the outer end of the aileron is also called the outboard aileron rib or the wing rib at the outboard end of the aileron bay. It is located 166 3/4 inches outboard of the butt rib.

b. A spirit level up to 48 inches long may be substituted for the 30 inch spirit level when setting the washout using the original method described in the Service Memo. The front end of the level must be placed at the front spar location regardless of the length of the level used. Excess length will extend aft past the 3/8 inch block.

c. A digital level 30 inches to 48 inches long may be substituted for the spirit level. If a digital level is used, place it fore and aft along the bottom of the rib adjacent to the outer end of the aileron on one wing, with the rear end of the level at the rear spar location. Adjust the rear lift strut fork in or out until the level reads -0.7 degree (front end of level lower than rear end). When the level reads -0.7 degree (the actual value, expressed to the nearest thousandth of a degree, is -0.717 degree, but most digital levels read to the nearest tenth of a degree) the wing will have the correct

washout. Repeat the procedure for the other wing.

d. Whether the washout is set by using a spirit level according to the original method described in the Service Memo or by using a digital level, the tolerance in the angle of incidence of the outboard aileron rib is +/- 1/4 of 1 degree. This is approximately equivalent to +/- 1/8 inch in the height of the 3/8 inch block used with the spirit level in the original method, or to +/- 0.2 degree in the reading of the digital level.

e. The correct wing washout of the Piper PA-18 model series and PA-19 airplanes is 2 1/2 degrees, the same as that of the Piper PA-12, PA-12S, and PA-14 airplanes. The PA-18 model series and PA-19 airplanes, however, have a wing angle of incidence of +1.843 degrees at the wing root (inboard end; i.e., the centerlines of the wing butt hinge bolts), while the PA-12, PA-12S, and PA-14 airplanes have a wing root angle of incidence of -0.060 degree. The negative angle of incidence at which the outboard aileron ribs of PA-18 model series and PA-19 airplanes must be set in order to produce 2 1/2 degrees of washout is therefore much smaller than the negative angle of incidence at which the outboard aileron ribs of PA-12, PA-12S, and PA-14 airplanes must be set in order to produce that same 2 1/2 degrees of washout. The wing span of PA-12, PA-12S, and PA-14 airplanes is also 3 inches greater than that of PA-18 model series and PA-19 airplanes, and the outboard aileron ribs of PA-12, PA-12S, and PA-14 airplanes are 4 9/16 inches farther from the center of the fuselage than those of PA-18 model series and PA-19 airplanes. These differences in aircraft configuration account for the differences between the instructions for setting the wing washout of PA-18 model series and PA-19 airplanes at 2 1/2 degrees and the instructions for setting the wing washout of PA-12, PA-12S, and PA-14 airplanes at 2 1/2 degrees.

**Piper  
Model PA 23-250  
Aztec**

**Technical Data  
Discrepancy  
2721**

A maintenance technician discovered a discrepancy between the Piper Aztec Service Manual (P/N F753564) and the aircraft. The discrepancy concerned the rudder trim tab travel limits.

After a discussion with a Piper representative, it was determined that the service manual is in error. The Piper representative confirmed that a revision will be issued to correct this problem. Until the service manual revision is issued, the correct rudder trim tab travel limits should be obtained from Type Certificate Data Sheet (TCDS) 1A10.

**Piper  
Model PA 24-250  
Comanche**

**Defective Engine  
Compartment Hoses  
2820, 2900, 3610, and  
7920**

During a scheduled inspection, all the flexible hoses in the engine compartment were found to be severely deteriorated.

This aircraft was manufactured in 1959, and it appeared that these hoses had been installed as original equipment. Flexible hoses are not designed or intended to last 38 years! The submitter stated these hoses were "fossilized and brittle." This subject has been discussed many times in this publication and other aviation maintenance publications; however, we continue to receive this type of report. Even if this aircraft had been stored in a climate-controlled hangar for this amount of time, the hoses would not be serviceable. Maintenance personnel are cautioned to inspect and replace all "aircraft installed" hoses as necessary.

Part total time-5,169 hours.

## ANEXO 3

### SUPLEMENTO

- 1- Si no se pueden encontrar las marcas de nivelación originales, el avión puede ser nivelado mediante una desviación del Paso 1 del Piper Aircraft Corporation Service Memo N ° 8 para el PA-12 de la siguiente manera:
  - a. Nivelar el avión lateralmente colocando un nivel de burbuja de 45,72 cm (18 pulgadas) de largo en la parte superior del tubo que soporta el borde delantero del asiento trasero, y ajustar alturas de los ejes del tren de aterrizaje principales hasta centrar la burbuja.
  - b. Nivelar el avión longitudinalmente colocando un nivel de burbuja de 45,72 cm (18 pulgadas) de largo en el piso de la cabina entre los puntos de sujeción delantero y trasero del tren de aterrizaje principal. Coloque el nivel en uno de los costados del asiento delantero, longitudinalmente, y colocar un espaciador de 1,3 cm (33/64 pulgadas) en su extremo trasero. Subir o bajar la cola hasta centrar la burbuja. Repetir el procedimiento con el nivel posicionado en el otro costado del asiento delantero. Si hay alguna diferencia en la altura de la cola necesaria para centrar la burbuja, ajuste la altura de la cola de manera de dividir la diferencia.
  - c. El nivel de burbuja puede ser sustituido por un nivel digital de 45,72 cm (18 pulgadas) de largo.
  - d. Si se utiliza un nivel digital, nivelar el avión lateralmente colocando el nivel en del tubo que soporta el borde delantero del asiento trasero, y ajustar alturas de los ejes del tren de aterrizaje principales hasta que el nivel esté en cero.
  - e. Nivelar el avión longitudinalmente colocando el nivel en el piso de la cabina entre los puntos de sujeción delantero y trasero del tren de aterrizaje principal. Coloque el nivel en uno de los costados del asiento delantero, longitudinalmente, colocándolo contra el piso. Subir o bajar la cola hasta que la lectura del nivel no sea menor que 1,6 grados ni mayor de +1,7 grados (el extremo delantero de nivel más alto que el trasero). Luego coloque el nivel en el otro costado del asiento delantero. Observe la lectura indicada por el nivel. Si la misma está entre 1.6 y 1.7, la nivelación es correcta, pero si la lectura es menos que 1,6 grados o mayor que 1,7 grados, ajustar la altura de la cola hasta que el promedio de las lecturas tomadas en los lados izquierdo y derecho del asiento delantero esté entre 1,6 y 1,7 grados (el valor exacto debería ser de 1.665 grados, pero la precisión de la mayoría de los niveles digitales es hasta décimos de grado).
- 2- El Paso 3 del Piper Aircraft Corporation Service Memo N° 8 para el PA-12 da el procedimiento para fijar la torsión geométrica de los semiplanos después de que el avión haya sido nivelado:
  - a. Coloque un bloque de 93.13mm (1 3/8 pulgadas) en uno de los semiplanos debajo del larguero posterior, a la altura de la costilla externa del alerón. Colocar un nivel de burbuja de 76,2 cm (30 pulgadas) de largo en sentido de la cuerda, con el extremo delantero del nivel apoyado en el larguero delantero y con el extremo trasero del nivel apoyado en el bloque antes colocado. Ajuste la horquilla del montante trasero hasta que la burbuja esté centrada. Cuando la burbuja esté centrada, el semiplano tendrá el una torsión geométrica de 2 ½ grados.
  - b. Repetir el procedimiento para la otra ala.
- 3- La siguiente información adicional se refiere a este procedimiento:
  - a. La costilla externa del alerón es la costilla de ala en el extremo exterior de la bahía de alerones. Se encuentra a 4.31 metros (169 11/16 pulgadas) desde la costilla de raíz.
  - b. Un nivel de burbuja de 1.220 metros (48 pulgadas) de largo puede sustituir al nivel de burbuja de 76,2 cm (30 pulgadas) cuando se ajusta la torsión geométrica utilizando el

método original descrito en el Service Memo. El extremo delantero del nivel debe ser colocado en el larguero delantero independientemente de la longitud del nivel utilizado. El exceso de longitud se extenderá más allá de del bloque 93.13mm (1 3/8 pulgadas).

- c. Si se utiliza un nivel digital, colocarlo en sentido de la cuerda bajo uno de los semiplanos, en la costilla externa de alerón, con el extremo posterior del nivel a la altura del larguero trasero. El exceso de longitud se extenderá hacia adelante más allá de la localización del larguero delantero. Ajustar la horquilla del montante trasero hasta que la lectura del nivel sea -2.6 grados (extremo delantero de nivel más bajo que la parte trasera). Cuando el nivel lea -2.6 grados (el valor exacto debería ser -2.627 grados) el semiplano tendrá una torsión geométrica de 2 1/2 grados. Repetir el procedimiento para la otra ala.

Si la torsión geométrica se establece mediante el uso de un nivel de burbuja de acuerdo con el método original o mediante el uso de un nivel digital, la tolerancia en el ángulo de incidencia de la costilla externa del alerón es +/- ¼ de grado. Esto es aproximadamente equivalente a +/- 3.17 mm (1/8 de pulgada) de la altura del bloque utilizado con el nivel de burbuja en el método original, o de +/- 0.2 grados en la lectura del nivel digital.