PIAGGIO AERO INDUSTRIES S.p.A.
Via Cibrario, 4 – 16154 Genoa, Italy
Product Support Department

The EASA states mandatory compliance with inspections, modifications or technical directives and related time compliance by means of relevant Airworthiness Directives.

SERVICE BULLETIN (MANDATORY) N.: 80-0249 REV. **1** **ATA CHAPTER:** 32

MODIFICATION N.: N.A.

TITLE: STEERING MANIFOLD LEAKAGE TEST

REVISION STATUS OF THE BULLETIN

This Bulletin is at the **Revision No. 1** status and consists of 9 pages.
This Revision 1 of the SB-80-0249 must be complied with even in compliance with the original issue.

1. PLANNING INFORMATION

A. EFFECTIVITY

Piaggio Aero Industries P180 Avanti and Avanti II, Manufacturer's Serial Numbers (MSN):

- ALL.

B. CONCURRENT REQUIREMENTS

None.

C. REASON

One case of poor sealing of the Steering Select / Bypass Valve (installed in the Steering Manifold) was observed, resulting in an uncommanded steering action. The aim of the procedure described in this Service Bulletin is to verify the leakage proofness of the Steering Manifold when the system is turned OFF and hydraulic power is available, by directly observing the behavior of the Steering Actuator.

This revision has been issued to provide acceptability criteria for airplanes that may show low leakage rates, and to improve the test procedure.

D. DESCRIPTION

General

This MANDATORY Service Bulletin consists of:

- Verification of the leakage proofness of the Steering Manifold, when the system is turned OFF and hydraulic power is available, by applying the procedure described at par. 2.

- In case that a movement of the Steering Actuator is detected, determination of the acceptability of the leakage rate by means of additional checks.

E. COMPLIANCE

This Service Bulletin shall be accomplished
- at the next scheduled inspection, or within 6 months (whichever occurs first)
- at each "A" inspection as long as the S.B. is active
- whenever a new/overhauled manifold is installed

In compliance with this Service Bulletin, please complete the attached Confirmation Slip and send it back to Piaggio Aero Industries S.p.A. Product Support Department.

F. APPROVAL

The technical content of this Service Bulletin has been approved under the Authority of DOA No. EASA.21J.220.

G. MANPOWER

This Service Bulletin may be accomplished in approximately 2 man-hours, if the first check is passed with no movement detected. 6 man-hours will be necessary to perform the leakage rate evaluation.

H. TECHNICAL INFORMATION

For questions concerning the technical content of this Service Bulletin, please contact Piaggio Aero Industries S.p.A. Airworthiness Office
- Via Cibrario, 4 - 16154 Genoa, Italy
- Fax No.: +39 010 6481 881
- E-Mail: airworthiness@piaggioaero.it

I. MATERIAL – COST AND AVAILABILITY

Please contact Piaggio Aero Industries Customer Support Department:
- Via Cibrario, 4 - 16154 Genoa, Italy
- Telephone No.: +39 010 6481 741
- Fax No.: +39 010 6481 309
- E-Mail: MMicheli@piaggioaero.it

J. TOOLING – COST AND AVAILABILITY

No. 1 Stopwatch is required.

No. 1 Greased plate

K. WEIGHT AND BALANCE

Not applicable

L. ELECTRICAL LOAD DATA

Not Affected.

M. REFERENCES

Airplane Maintenance Manual, Chapter 07-10-00
Airplane Maintenance Manual, Chapter 09-10-00
Airplane Maintenance Manual, Chapter 24-00-00
Airplane Maintenance Manual, Chapter 32-50-00

N. PUBLICATIONS AFFECTED

N.A.

2. ACCOMPLISHMENT INSTRUCTIONS

Procedure

CAUTION

EACH TIME THE NOSE WHEEL STEERING PIN IS REMOVED AND INSERTED, BE CAREFUL THAT NO DAMAGE IS MADE TO THE BUSHING.

WHEN CENTERING THE ACTUATOR, PULL/PUSH THE ACTUATOR BY HAND. DO NOT USE TOOLS THAT MAY DAMAGE IT.

PART A – WEIGHT ON WHEELS, NO LOAD ON STEERING ACTUATOR

1) Make sure electrical power is available (Refer to AMM sect. 24-40-00)
2) Verify availability of Hydraulic pressure (1000 psi) on the indicator.
3) Select “STEER - TAXI”.
4) Command zero steering angle with Rudder Pedals.
5) Select “STEER OFF”
6) Turn OFF hydraulic pressure
7) Disconnect the nose wheel steering pin (ref. AMM 09-10-00 pag.203 fig.202).
8) Turn ON hydraulic pressure
9) Select “STEER – TAXI”
10) Command full left steering with the pedals (reaching full stroke of the actuator)
11) Command right steering with the pedals, and immediately after (within 1 sec) select “STEER OFF” and turn OFF the hydraulic pressure.
12) Manually center the actuator (insert the nose wheel steering pin as a reference for proper alignment - ref. AMM 09-10-00 pag.203 fig.202)
13) Disconnect the nose wheel steering pin (ref. AMM 09-10-00 pag.203 fig.202).
14) Turn ON the hydraulic pressure and start the stopwatch at the same time
15) No movement of the Actuator shall be observed for 1 minute after selecting “HYD ON”.
16) Select “STEER - TAXI”.
17) Command zero steering angle with Rudder Pedals.
18) Command full right steering with the pedals (reaching full stroke of the actuator)
19) Command left steering with the pedals, and immediately after (within 1 sec) select “STEER OFF” and turn OFF the hydraulic pressure.
20) Manually center the actuator (insert the nose wheel steering pin as a reference for proper alignment - ref. AMM 09-10-00 pag.203 fig.202)
21) Disconnect the nose wheel steering pin (ref. AMM 09-10-00 pag.203 fig.202).
22) Turn ON the hydraulic pressure and start the stopwatch at the same time

23) No movement of the Actuator shall be observed for 1 minute after selecting “HYD ON”.
24) Repeat points 2) to 23) 4 more times.
25) Turn OFF the hydraulic pressure
26) Evaluate test results:
   – If no movement of the Steering Actuator is observed, proceed with Part D. Part B and C are not required to be performed
   – If the Steering Actuator moves reaching the full stroke within 1 minute during at least one test, the Manifold shall be replaced (ref AMM 32-50-00), then proceed with part D.
   – If the Steering Actuator moves, but does not reach the full stroke within 1 minute during all tests, record the time needed to reach the full stroke (take note of the minimum time recorded during the tests), and proceed with Part B.

PART B – AIRCRAFT ON JACKS

NOTE

Steps from 27 to 40 shall be performed with weight still on wheels

27) Verify that the nose wheel steering pin is inserted
28) Make sure electrical power is available (Refer to AMM sect. 24-40-00)
29) Verify availability of Hydraulic pressure (1000 psi) on the indicator.
30) Select “STEER - TAXI”.
31) Command zero steering angle with Rudder Pedals.
32) Select “STEER OFF”.
33) Turn OFF hydraulic pressure
34) Disconnect the nose wheel steering pin (ref. AMM 09-10-00 pag.203 fig.202).
35) Turn ON hydraulic pressure
36) Select “STEER – TAXI”
37) Command full left steering with the pedals (reaching full stroke of the actuator)
38) Command right steering with the pedals, and immediately after (within 1 sec) select “STEER OFF” and turn OFF the hydraulic pressure.
39) Manually center the actuator (insert the nose wheel steering pin as a reference for proper alignment - ref. AMM 09-10-00 pag.203 fig.202)
40) Verify that the nose wheel steering pin is inserted
41) Put the aircraft on jacks (ref. AMM section 07-10-00) and verify that NLG is fully extended.
42) Turn ON the hydraulic pressure and start the stopwatch at the same time.
43) No rotation of the NLG shall be observed for 5 minutes after selecting “HYD ON”.
44) Select “STEER - TAXI”.
45) Command zero steering angle with Rudder Pedals.

46) Select “STEER OFF”.
47) Turn OFF hydraulic pressure
48) Disconnect the nose wheel steering pin (ref. AMM 09-10-00 pag.203 fig.202).
49) Lower the FWD jack in order to engage the NLG WOW switch.
50) Turn ON hydraulic pressure
51) Select “STEER – TAXI”
52) Command full right steering with the pedals (reaching full stroke of the actuator)
53) Command left steering with the pedals, and immediately after (within 1 sec) select “STEER OFF” and turn OFF the hydraulic pressure.
54) Manually center the actuator (insert the nose wheel steering pin as a reference for proper alignment - ref. AMM 09-10-00 pag.203 fig.202)
55) Verify that the nose wheel steering pin is inserted.
56) Raise the FWD jack in order to remove weight from the NLG.
57) Turn ON the hydraulic pressure and start the stopwatch at the same time
58) No rotation of the NLG shall be observed for 5 minutes after selecting “HYD ON”.
59) Turn OFF the hydraulic pressure
60) Evaluate test results
    - If no rotation of the NLG is observed, proceed with Part C.
    - If any rotation of the NLG is observed, the Steering Manifold shall be replaced before further flight (ref AMM 32-50-00), then proceed with part D. Perform part A of this Service Bulletin after Steering Manifold replacement.

PART C – ADDITIONAL TESTS ON GROUND, PIN CONNECTED

61) Remove the airplane from jacks (ref. AMM 07-10-00), putting the NLG on a “Greased Plate” (ref. section 3 – Material Information)
62) Make sure electrical power is available (Refer to AMM sect. 24-40-00)
63) Verify availability of Hydraulic pressure (1000 psi) on the indicator.
64) Select “STEER - TAXI”.
65) Command zero steering angle with Rudder Pedals.
66) Select “STEER OFF”.
67) Turn OFF hydraulic pressure
68) Disconnect the nose wheel steering pin (ref. AMM 09-10-00 pag.203 fig.202).
69) Turn ON hydraulic pressure
70) Select “STEER – TAXI”
71) Command full left steering with the pedals (reaching full stroke of the actuator)
72) Command right steering with the pedals, and immediately after (within 1 sec) select “STEER OFF” and turn OFF the hydraulic pressure.

73) Manually center the actuator (insert the nose wheel steering pin as a reference for proper alignment - ref. AMM 09-10-00 pag.203 fig.202)
74) Verify that the nose wheel steering pin is inserted
75) Turn ON the hydraulic pressure and start the stopwatch at the same time
76) No rotation of the NLG shall be observed for 1 minute after selecting “HYD ON”.
77) Select “STEER - TAXI”.
78) Command zero steering angle with Rudder Pedals.
79) Select “STEER OFF”.
80) Turn OFF hydraulic pressure
81) Disconnect the nose wheel steering pin (ref. AMM 09-10-00 pag.203 fig.202).
82) Turn ON hydraulic pressure
83) Select “STEER – TAXI”
84) Command full right steering with the pedals (reaching full stroke of the actuator)
85) Command left steering with the pedals, and immediately after (within 1 sec) select “STEER OFF” and turn OFF the hydraulic pressure.
86) Manually center the actuator (insert the nose wheel steering pin as a reference for proper alignment - ref. AMM 09-10-00 pag.203 fig.202)
87) Verify that the nose wheel steering pin is inserted
88) Turn ON the hydraulic pressure and start the stopwatch at the same time
89) No rotation of the NLG shall be observed for 1 minute after selecting “hyd on”.
90) Evaluate test results
    - If no rotation of the NLG is observed, replace the manifold within 10 flights (ref AMM 32-50-00), performing the first test (no load on actuator, step 1 to 23) before each flight, recording the value and monitoring the trend (Time needed to reach the full stroke of the actuator shall differ less than 5 seconds with reference to the previous test performed, and in any case shall be greater than 1 minute; in case of doubt, contact Piaggio Aero Technical Support and/or Piaggio Aero Airworthiness Office). Perform part A of this Service Bulletin after Steering Manifold replacement.
    - If a rotation of the NLG is observed, replace the Steering Manifold before further flight (ref AMM 32-50-00), then proceed with part D. Perform part A of this Service Bulletin after Steering Manifold replacement.

PART D – CONTACT PIAGGIO AERO TECHNICAL SUPPORT

91) Contact Piaggio Aero Technical Support and communicate the following data using the attached confirmation slip:
- A/C Manufacturing Serial Number (MSN)
- A/C flight hours and landings
- Steering manifold S/N
- Steering manifold flight hours and cycles (i.e., landings)

92) Make an entry in the airplane logbook to show compliance with this Service Bulletin.

3. MATERIAL INFORMATION

A. LIST OF MODIFICATION KIT COMPONENTS

Not Applicable

B. LIST OF MATERIALS – OPERATOR SUPPLIED

Not Applicable.

C. LIST OF TOOLS

No. 1 Stopwatch

No.1 Greased plate, consisting of two square aluminum alloy plates approx 50 cm X 50 cm whose contact is greased. This allows the rotation on wheels of the steering during the test.

D. DISPOSAL OF REMOVED PART

Contact Piaggio Aero Industries S.p.A. – Product Support Department

PIAGGIO AERO INDUSTRIES S.p.A.
Via Cibrario, 4 – 16154 Genoa, Italy
Product Support Department

CONFIRMATION SLIP

Service Bulletin Accomplishment		**SB-80-0249 Rev.1**
A/C S/N:	A/C Flight Hours:	A/C Registration:
A/C Landings:		
Steering manifold S/N:	Steering Manifold Flight Hours:	Steering manifold cycles:
Inspection Results:		
Date:		
Accomplished by:		
Signature		