AIRWORTHINESS BULLETIN

Lubrication of Landing Gear – Piper Aircraft

AWB 32-005 **Issue** : 1
Date : 27 September 2005

1. Applicability

Piper Aircraft models:

PA-31;
PA-31-300;
PA-31-325 Navajo;
PA-31-350 Chieftain;
PA-31-350 T-1020;
PA-31P Pressurized Navajo;
PA-31T Cheyenne, Cheyenne II;
PA-31T1 Cheyenne I;
PA-31T2 Cheyenne II XL;
PA-31T3 T-1040; and
PA-42 Cheyenne III.

2. Background

During preparation for landing, the pilot of a Piper PA-31-350 Chieftain aircraft selected landing gear down but the right main down-light did not illuminate. The aircraft eventually landed with the landing gear up. Substantial damage occurred to the aircraft.

Preliminary investigation conducted by Australian Transport Safety Bureau (ATSB) identified inadequate lubrication of the main landing gear (MLG) down-lock assembly pivot as the main contributory factor. The MLG hook assembly did not fully engage resulting in non actuation of the down-light micro-switch (ATSB Investigation Report 200503694).

A joint review of the Service Difficulty Reports / Accidents / Incidents database by ATSB & CASA revealed additional events related to MLG down-lock defects or anomalies.

2.1 Analysis

The aircraft manufacturer traces the problem of landing gear down-lock failure to the following factors:

i. Lack of inspection and / or lubrication for actuator rod end bearing, down-lock latch and pivot bolt, leading to corrosion, improper ball rotation and jamming.

ii. Location of the exhaust outlets on the PA-31, PA-31-300, PA-31-325, PA-31-350, and PA-31P aircraft exacerbates the problem.

iii. Rod end bearing race damage (that may occur during maintenance/rigging activity) also results in landing gear system difficulties and/or premature rod end bearing replacements.

Piper Service Letter SL 755 acknowledges the problem and addresses it through periodic inspection, lubrication and replacement of landing gear parts.

CASA reviewed the Piper Navajo Chieftain Service Manual and the latest revision of Service Letter (SL) 755. It was determined that the Service Manual compliance interval of 100 hours for inspection / lubrication of the MLG down-lock assembly pivot needed revision to account for harsher Australian operational environment, where landing gear parts are more prone to dust contamination in comparison to other geographical locations.

3. Recommendation

In order to address the safety risk associated with MLG failure to lock down, CASA recommends compliance with Piper Service Letter (SL) 755 and inspection / lubrication of the landing gear lock actuator rod and rod-end bearing assemblies including the down-lock latch and pivot bolt, every 50 hours plus / minus 5 hours and whenever landing gear and wheel areas have been washed, as per provisions of Part 1 of Piper SL 755 – latest revision.

Ensure that the lubricant used is approved for the purpose, and is the most appropriate for the operating environment.

3.1 Summary

Inspection intervals of 100 hours for inspection and lubrication of Piper PA-31 series and PA-42 series aircraft landing gear are inadequate for some Australian operating conditions.

Failure to comply with the recommendations of this AWB may result in difficulties in operation of the landing gear system.

3.2 Service Difficulty Reporting Program

All events related to landing gear failure or any other defects in the aircraft should be reported to CASA on the Service Difficulty Reporting (SDR) program available on the CASA website
http://casa.gov.au/airworth/sdr/index.htm

In submitting such SDRs, please include as much detail as possible. One or more photographs of the affected components are particularly valuable.

4. Enquiries

Enquiries with regard to the content of this Airworthiness Bulletins should be made via the direct link e-mail address: AirworthinessBulletin@casa.gov.au

Or in writing, to:

Manufacturing, Certification and
New Technologies Office,
GPO Box 2005, Canberra, ACT, 2601