Feedback

Canadian Aviation Service Difficulty Reports

The following content was published between 1 October 2021 and 31 December 2021.The full accessible version of each article is available on the Feedback website.

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Hangar Noise

Bombardier, CL600 2D24 (RJ900)

Fuel Leak Due to Slat Canister Crack

SDR #: 20191203018

Subject:

Fuel leakage was noted on the underside of the left wing. Through visual examination, it was determined that the source was the leading edge slat canister assembly for the retraction and stowage of the driven slat track located on the left wing at station 163.00. Fuel seepage did not present itself until approximately 4000 pounds of total fuel was added to the tank due to the location of the crack. The canister assembly damage was found on the aft side, interior radius of the plate flange, where the flange plate joins to the canister tube and is adjacent to the weld (approximately 0.125 inches forward of the weld running parallel to the weld).

Transport Canada Comments:

The slat canisters provide a space for the slat tracks to retract into the fuel tank area and must also provide a seal against fuel leaks. These are welded and formed parts that are subjected to wing bending moments and flex stress during both flight and ground operations. The stresses on these formed parts will sometimes lead to cracking and fuel leakage as in this case.

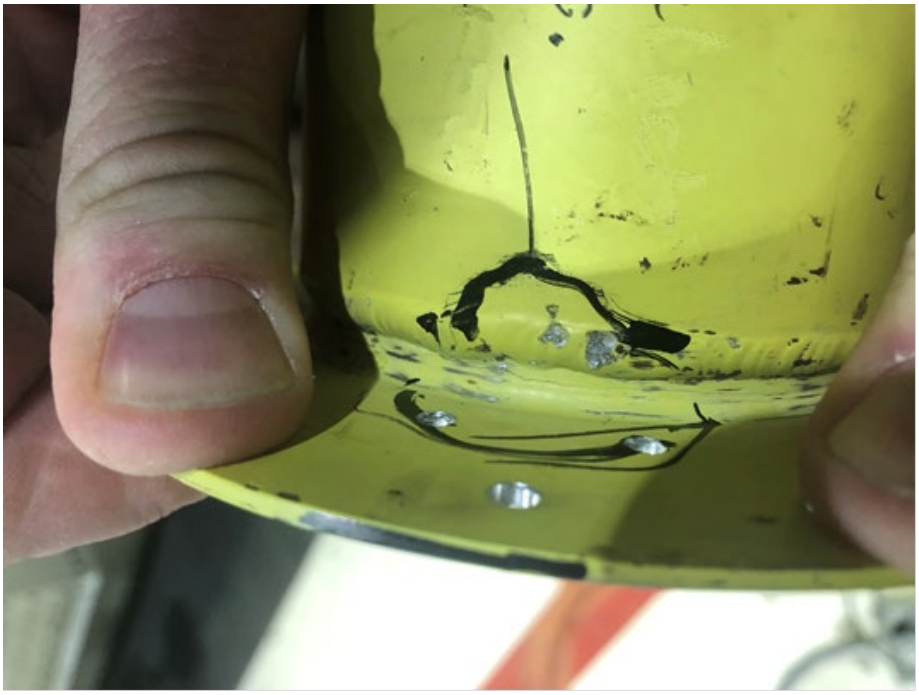


Figure 1: Cracked area of flange radius shown in circled area

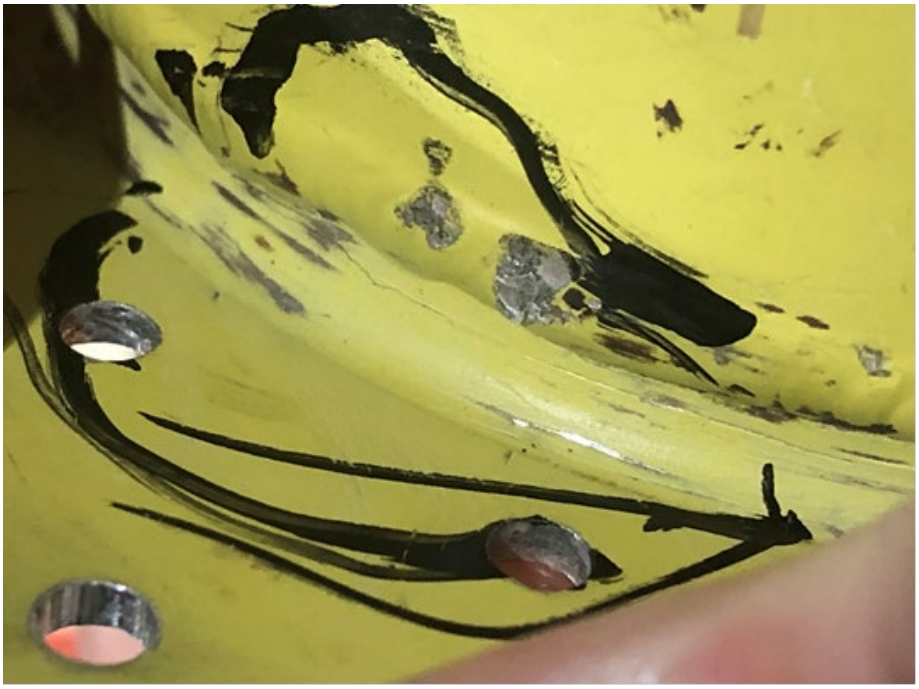


Figure 2: Close-up of cracked area

Heads up

Pilatus, PC12 47E

Bleed Air Overtemperature Switch – Revised Test Procedure

SDR #: 20200604010

Subject:

The test procedure listed in Aircraft Maintenance Manual (AMM) 12-B-21-40-06-00A-903A-A was carried out on the bleed air overtemperature switch. According to the test procedure, the switch is supposed to activate at 290℃, ± 6℃. The installed switch failed, as did a new one that was installed. Multiple new switches were checked, and all were activated at 325℃ or higher. Pilatus, the aircraft manufacturer, was contacted and issued Technical Memo TM-12-006654, which revised the test procedure. Under the provisions of the new test procedure, only the original switch passed, the other (all new) switches still failed. It is suspected that there is a bad batch of switches. As there is no requirement to test a new switch prior to installation, it is possible that a faulty switch could be installed.

Transport Canada Comments:

Pilatus has determined the problem to be the testing procedure and equipment defined in the AMM. The Quick Cal temperature calibrator that is prescribed does not heat the temperature switch to the temperature displayed. Therefore, as described in the TM-12-006654, the calibrator must be set to a higher temperature.

Here is an extract of the Test from the revised PC-12/47E AMM (for reference only):

12-B-21-40-06-00A-903A-A OVERTEMPERATURE SWITCH -Adjustment/Test

- §2.2.6 Changed from 283°C to 289°C.
- §2.2.8 Changed from 296°C to 330°C
- §2.2.10 Changed from 290°C±6°C to between 290°C and 330°C

The purpose of this Feedback article is to advise Pilatus PC-12 aircraft operators and maintainers of a revised procedure to test the bleed air overtemperature switch. Please follow the new procedure prescribed within the latest AMM revision.

Fixed Wing

Beech, A100

King Air Horizontal Stabilizer Bracket Cracked

SDR #: 20210917031

Subject:

During routine inspection, the bracket between the horizontal stabilizer, fuselage, and vertical stabilizer was found cracked. This may have been caused by a screw from the tail cone coming into contact with the bracket, causing a stress riser.

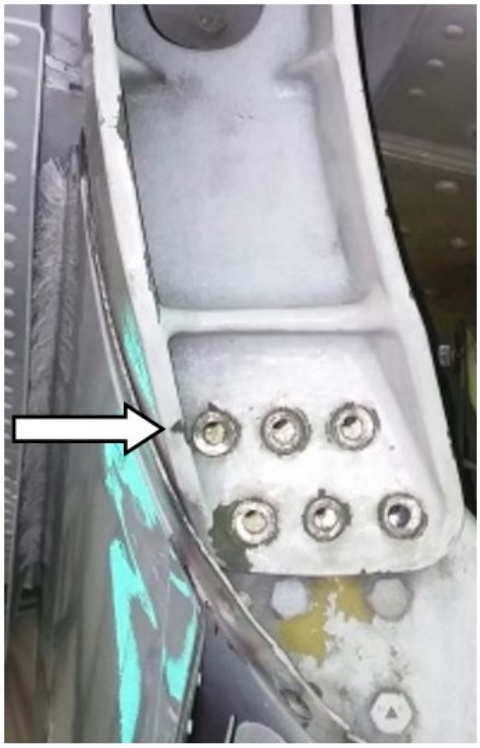
Transport Canada Comments:

In addition to the safety message related to the same topic in Feedback publication Issue 1/2015 shown below, care must be taken when installing the tail cone of these aircraft. In at least three (3) cases, damage to the horizontal stabilizer bracket resulting in a crack had been caused by the use of improper hardware when installing the tail cone. Similar findings have also been reported on model 99 series aircraft.

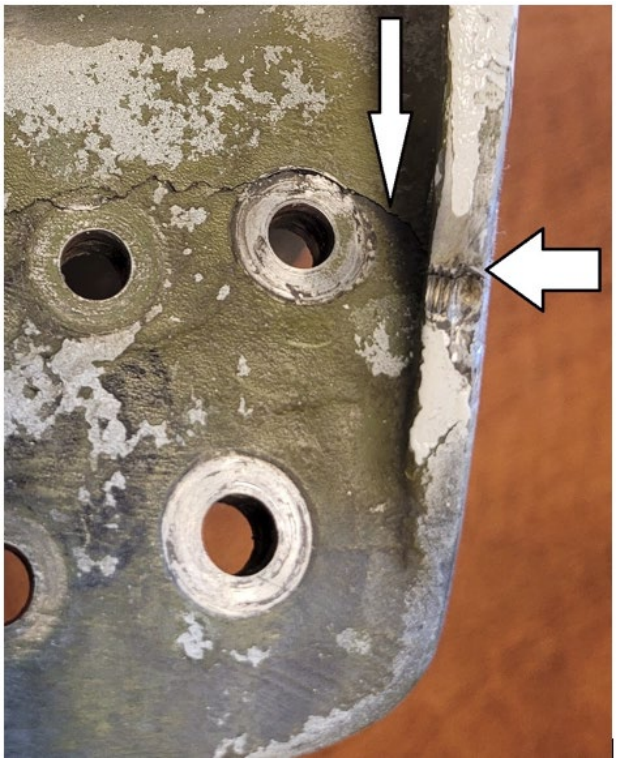
Feedback Issue 1/2015 – King Air Stabilizer Bracket Cracked

“As aeroplanes age, it is important to take your time to properly inspect all areas in order to find damage that could progress to a failure of the part. Proper lighting is important so that you can see what you are inspecting.”

The pictures below, taken of two separate aircraft, depict both left-hand and right-hand brackets cracked in the same location.



Picture 1 – Left-hand horizontal stabilizer bracket crack



Picture 2 – Right-hand horizontal stabilizer bracket crack

Bombardier, CL600 2C10 (RJ700)

Bleed Air Supply Duct Cracked at Welded Flange

SDR #: 20200110007

Subject:

The left-hand (LH) side bleed air supply duct that passes through the aft pressure bulkhead was found cracked at the welded flange on the aft side of the bulkhead.

Transport Canada Comments:

The submitted Service Difficulty Report (SDR) did not discuss how this defect was found, but it should be noted that the area is fairly difficult to access and inspect. Being aware that defects have been found in this location may help maintainers when troubleshooting snags or looking for defects during scheduled inspections.

Figure 1: LH bleed air supply duct leak location

Figure 2: Duct cracked flange shown

Cessna, 180J

Cracked Engine Mount Tube

SDR #: 20211008015

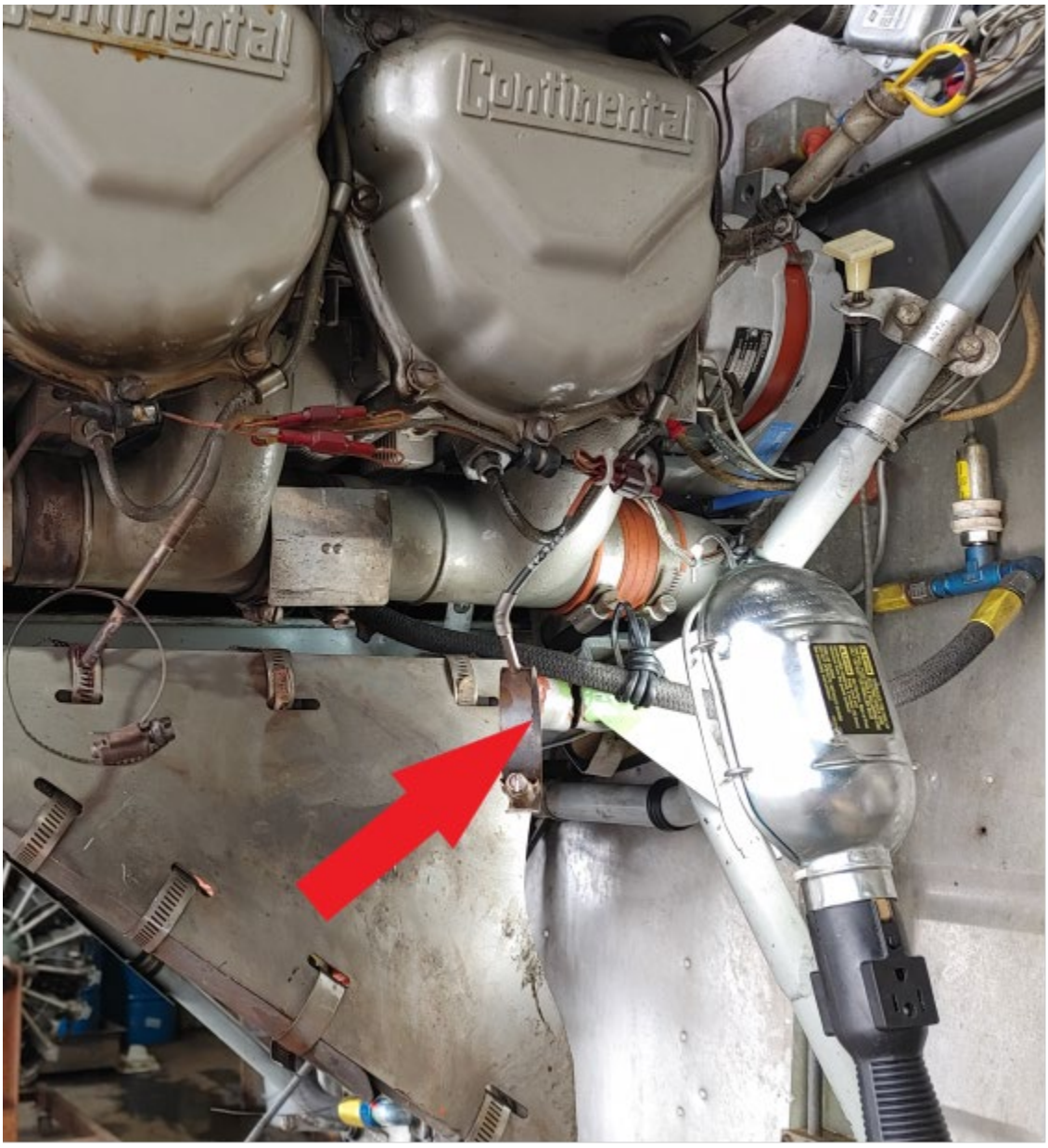
Subject:

During a scheduled inspection, we found a broken engine mount tube. This aircraft is equipped with a three-blade Hartzell propeller and always had a slight vibration compared to our other two Cessna 180's equipped with a two-blade McCauley propeller, although the vibration was not excessive. The vibration lessened a bit when we balanced the propeller in April 2021. From asking pilots who have flown this aircraft recently, they had not noticed an increase in vibration since the spring.

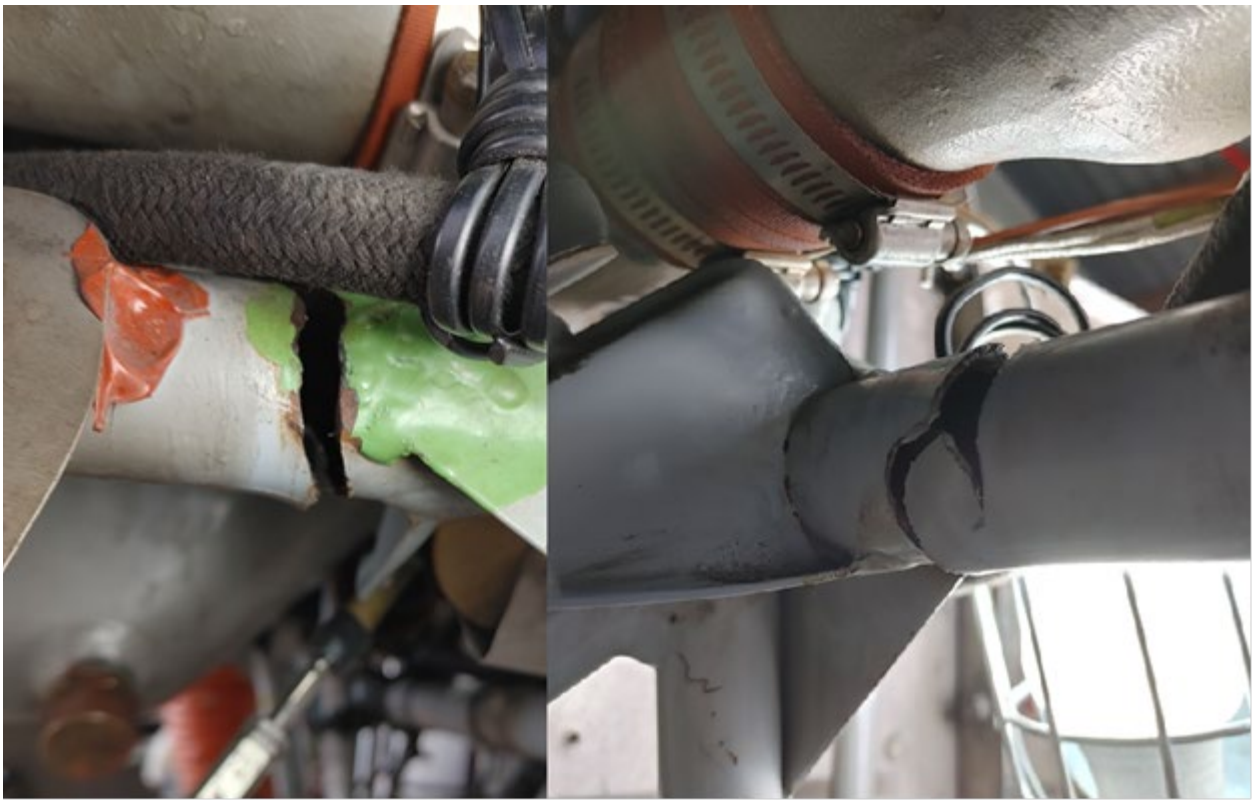
Transport Canada Comments:

Preferably, defects such as these should be found prior to complete failure. Contributing factors could include worn isolation mounts, propeller imbalance, and corrosion. This type of failure is avoidable but could go unnoticed as the submitter of this service

difficulty report (SDR) experienced. Special attention should always be given to the inspection of mounting structures when dealing with vibrations.



Picture 1 – Engine mount tube location



Picture 2 – Outboard and inboard view

Cessna, 208B

Standby Alternator Drive Bearing Failure

SDR #: 20200930014

Subject:

During a flight to xxx, the pilot noticed that the standby power inoperative (INOP) light had illuminated. He then diverted back to xxx, contacted maintenance about the issue and noted that all oil pressure, torque and power output of the engine (Ng) indications were normal. Shortly after the conversation with maintenance, the pilot observed that the oil pressure gauge started to fluctuate. The fluctuations continued to worsen as the flight continued and the pilot elected to divert to a closer airport. The pilot landed the aircraft with no major issues. Maintenance went to inspect the aircraft and noticed a streak of oil along the right side of the fuselage. While inspecting the engine, maintenance noticed that the alternator pulley had a slight wobble. They removed the alternator pulley drive assembly and the oil scavenge pump drive shaft came out along with the alternator pulley drive assembly. The oil scavenge pump drive shaft had sheared off where it couples with the alternator drive shaft. After disassembling the alternator pulley drive assembly, the bearing on the side of the pulley had come apart and the ball bearings came out of the housing.

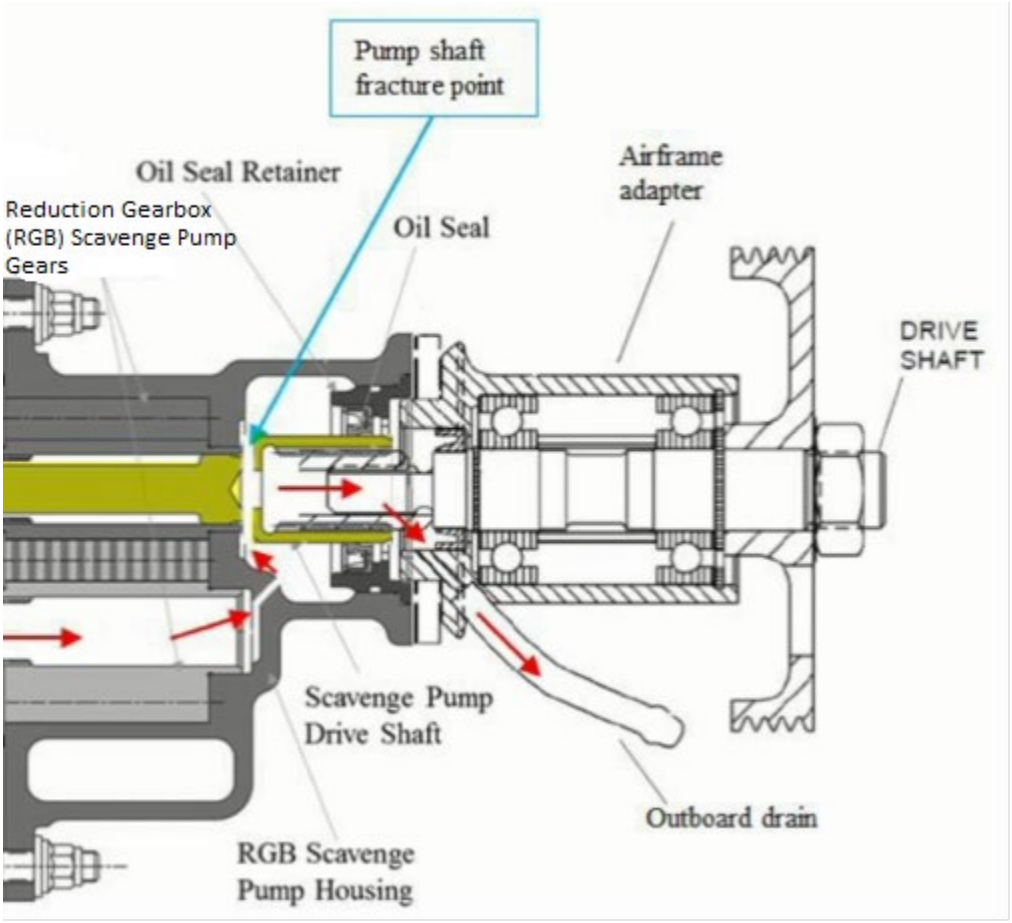
Transport Canada Comments:

Textron Aviation suggests removing the alternator drive belt during Manual Task 24-36-00-220 (Inspection Document 07 – 400hr / 12 month inspection). Refer to Single-Engine Turboprop Communique # SE-TP-004.

“Removing the alternator belt during this inspection allows for a more thorough check of the pulley assembly, as it does for checking side-to-side play.”

Transport Canada Civil Aviation (TCCA) suggests owners, operators, and maintainers pay particular attention to this area and continue to report any defects noted.

Picture 1 – Alternator pulley drive shaft, bearing failure



Picture 2 – Oil scavenge pump drive shaft, failure location

Piaggio, P180 Avanti II

Loose Jam Nuts on Rudder Trim Actuator

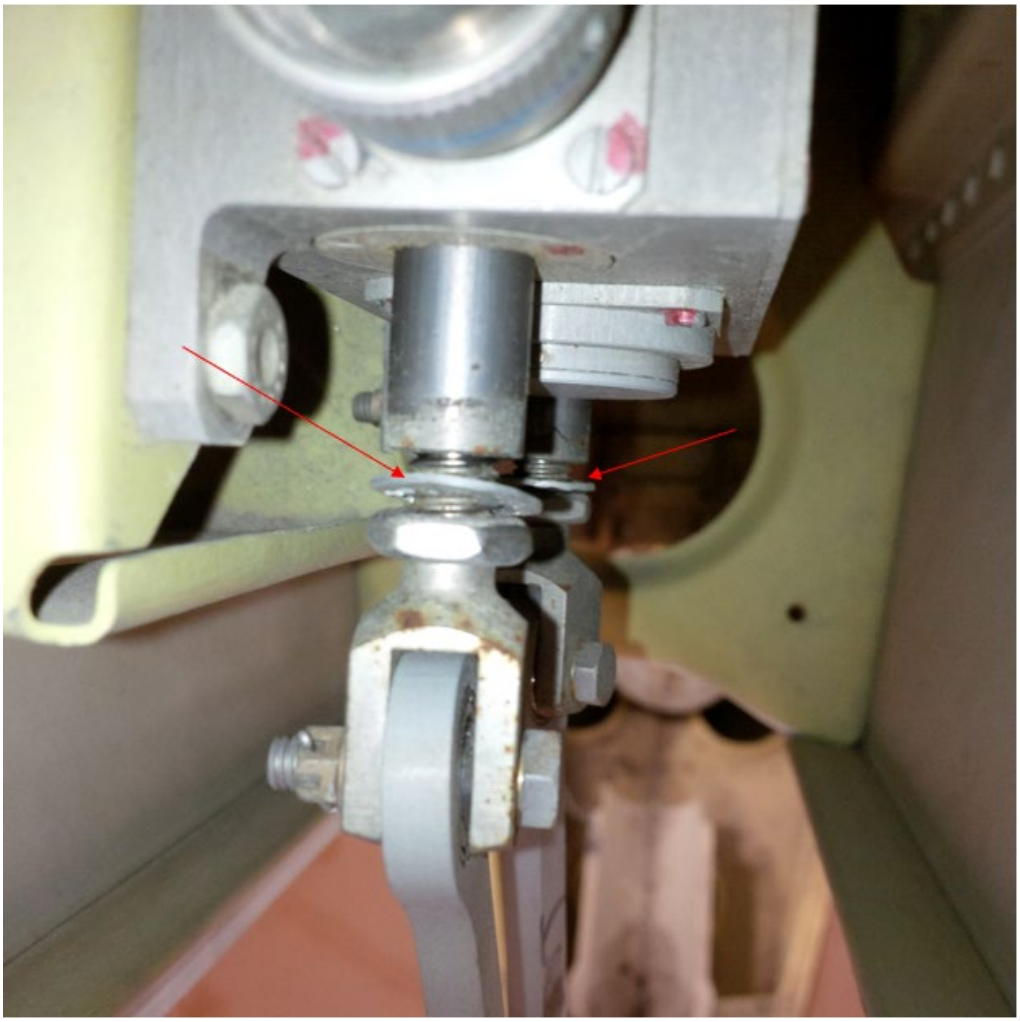
SDR #: 20160113002

Subject:

During inspection, it was noticed that the rod end jam nuts were not secure on the rudder trim actuator.

Transport Canada Comments:

After consultation with the service difficulty report (SDR) submitter, Transport Canada Civil Aviation (TCCA) understood that the area was inspected in accordance with Service Bulletin (SB) 80-0444. No other occurrences have been reported to TCCA. Operators and maintainers of these aircraft are reminded, that whenever performing maintenance in this area, to remain vigilant and observant for this reported condition. If the condition of loose jam nuts is found, please submit an SDR accordingly.



Rudder trim actuator loose jam nuts

Piper, PA23 250

Piper Aztec Emergency Exit Window Assembly

SDR #: 20210302019

Subject:

The emergency exit window assembly departed inflight.

Transport Canada Comments:

The occurrence aircraft had undergone maintenance just prior to the incident flight. It was determined that the emergency exit window assembly was not installed correctly, possibly due to a lack of clarity of the instructions in the maintenance manual (MM).

In addition to the above occurrence, there could be a link to an accident in 2019 where the emergency exit window assembly could not be opened. It was impossible to

determine the exact cause of this failure, as the assembly was completely destroyed by the post-impact fire.

Link to Transportation Safety Board of Canada (TSB) Air transportation safety investigation report A19Q0091

“A post-impact fire broke out. Given that the fire was burning near the right wing, on the side where the main door was located, the pilot and the passenger-instructor went to the back of the aircraft with the intention of opening the emergency exit window on the left side, but they could not get it open. They were still able to evacuate the aircraft through this window because the plexiglass had been shattered on impact.”

Piper Aircraft completed a thorough review of the MM instructions relevant to the emergency exit window assembly used on the PA-23-250 model. The applicable MM, part number (P/N) 753-564 has been revised, dated 31 July 2021. This latest revision provides clear, detailed instructions for the removal and installation of the emergency exit window assembly.

Transport Canada Civil Aviation (TCCA) strongly suggests owners, operators and maintainers review and adopt the latest publication of Piper Aztec MM P/N 753-564.

Picture 1 – Side view of the Piper PA-23-250 aircraft showing the emergency exit window (Source: TSB A19Q0091)

Picture 2 – Emergency exit window removed (Source: TSB A19Q0091)

Engines

Pratt & Whitney-CAN, PW127M

Re-orientation of Bus-Bar Support Bracket Bolts

SDR #: 20201127003

Subject:

The pilot observed high inter-turbine temperature (ITT) on the left engine during climb and elected to safely return to the airport of origin. During troubleshooting, one thermocouple leg was found touching the mount base. It was isolated and secured, and the aircraft was released back to service.

Transport Canada Comments:

Pratt & Whitney Canada Service Bulletin (SB) 21931 is related to this issue. In summary, the calculated value for the ITT can fluctuate due to intermittent contact between the negative bus-bar support bracket bolts and the turbine support case (TSC) insulation blanket. To eliminate interference, the SB provides instructions to re-orient the negative bus-bar support bracket bolts to increase the clearance with the TSC insulation blanket. Transport Canada, Civil Aviation (TCCA) recommends compliance with this SB.

Williams, FJ44-3A

Electrical Connector Arcing

SDR #: 20210118032

Subject:

The aircraft was taxiing to depart, and during taxi, a fail message ENG T2 HTR fail came on and the aircraft returned to the hangar. The turbine temperature (TT2) sensor failed, and on inspection, the wiring harness to the probe had arcing in the connector.

Transport Canada Comments:

With the vast assortment of monitoring and indicating systems on aircraft engines, an electrical harness may contain numerous electrical connectors of different applications and sizes. As well, these connectors have multiple fastening features, from the standard threaded connector, to quick disconnect bayonet connectors, to name a few.

In this event, the arcing of the contact in the connector may have been caused by an internal failure, or damage to the connector sealing grommets, or a foreign object shorting between contacts, or shorting by corrosion from moisture ingress, as examples. From the photos provided, it appears that the keyways are serviceable, which would rule out misalignment of the connection.

Commonly, the repair and maintenance of electrical connectors is carried out in accordance with either the manufacturer’s principle Instructions for Continued Airworthiness (ICA) or Advisory Circular (AC) 43-13, which provide a wide range of standard practices. Transport Canada would also like to highlight that many manufacturers now publish specific electrical standard practice procedure manuals for their products. These procedures have useful information specific to connector care, as well as recommended products used to protect from moisture or other liquids when environmental protection is needed. When performing tasks on or around electrical wiring or hardware, remember to consult the manufacturer’s specific connector care publications, if provided.

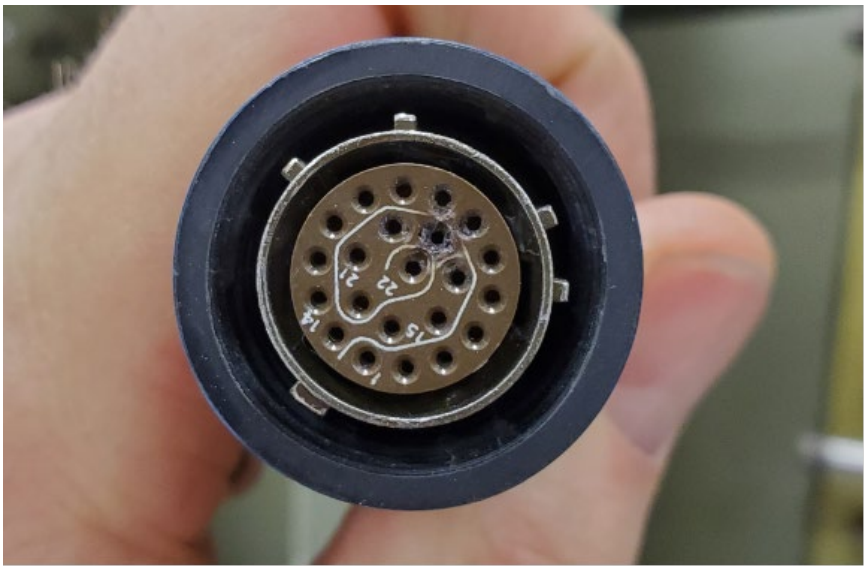


Photo 1 – Electrical connector socket with arcing damage

Photo 2 – Electrical connector pin with arcing damage

Rotorcraft

Aerospatiale HC, AS 350B2

Main Gearbox Oil Filter Gasket

SDR #: 20201127013

Subject:

During the final two minutes into approach for landing after a maintenance test flight, the main gearbox (MGB) low pressure light came on. The pilot returned immediately to the landing pad at the hangar and advised that the aircraft landed without the MGB oil temperature light coming on. The MGB ran 1 minute 30 seconds in flight with the low pressure light, and 30 seconds on the ground for cool down. During the investigation, maintenance discovered that the gasket from the previous spin on filter had stuck to the housing on the MGB, and the new filter was spun on with it still in place not allowing the new filter to seal properly, and therefore allowing the oil loss. Maintenance installed a new filter, cleaned the aircraft and added the correct amount of synthetic oil. Maintenance did a 30 minute ground run, loading the MGB to the point just before hovering. There were no chip lights and after shutdown, there were no chips on any magnetic plugs. The aircraft maintenance manual (AMM) 05-50-00, 6-1 indicates the replacement of the MGB, mast bearings and possibly the main rotor shaft, and roughly 500ml of Mobil-jet 254 synthetic fluid was still in the transmission when drained. The gasket on the filter is of a thick black rubber and loose removal type can potentially be left in situ on the filter housing. Other spin-on filters, which have the gasket swaged onto the top of the filter housing, are not easily removed and come off, and are part of the filter cartridge.

Transport Canada Comments:

The submitter of this service difficulty report (SDR) has identified a physical difference in the gasket seating area of the oil filter even for the same part number (P/N) 7050A3632296 (alternate P/N FA01315A). Specifically, the oil filter gasket seating area could either allow the gasket to be removed freely, or be partially retained by an intentional swage in the filter housing completed during manufacture. Airbus Helicopters published Information Notice 3631-I-63 to clarify the maintenance of pre and post MOD 077162 MGB oil filters by helicopter configuration. The P/N 7050A3632296 (alternate P/N FA01315A) oil filters are post MOD 077162 and considered to be non-cleanable type filters. They are replaced in accordance with the maintenance instructions published in the master servicing manual. Transport Canada Civil Aviation (TCCA) wishes to make maintainers aware that the gasket that belongs with a removed MGB oil filter, has the potential to remain in place on the MGB filter support during maintenance and should be removed prior to the new filter installation.

Suspected Unapproved Parts (SUP)
In Canada, SUPs are reported in accordance with section 571.13 of the standard of the Canadian Aviation Regulation (CAR).

When you suspect an unapproved part, the SUP report can be submitted on the SDR form or through the Web Service Difficulty Reporting System

To view the most recently published Suspected Unapproved Parts, click here or go to this website https://tc.canada.ca/en/aviation/aircraft-airworthiness/continuing-airworthiness/feedback-canadian-aviation-service-difficulty-reports/suspected-unapproved-parts-sups

FAA Unapproved Parts Notifications (UPN)
Unapproved Parts Notifications are published by: FAA, AIR-140, P.O. Box 26460, Oklahoma City, OK 73125. They are posted on the Internet at: https://www.faa.gov/aircraft/safety/programs/sups/upn/

To view the most recently published FAA Unapproved Parts Notifications (UPN), click here or go to this website http://www.tc.gc.ca/eng/civilaviation/certification/faa-unapproved-parts-notifications.html

FAA Special Airworthiness Information Bulletins (SAIB)
A Federal Aviation Administration (FAA) SAIB is an information tool that alerts, educates, and makes recommendations to the general aviation community. It is non-regulatory information and guidance that does not meet the criteria for an Airworthiness Directive (AD). They are posted on the Internet at: https://www.faa.gov/aircraft/safety/alerts/SAIB/

To view the most recently published FAA Special Airworthiness Information Bulletins (SAIB), click here or go to this website http://www.tc.gc.ca/eng/civilaviation/certification/faa-special-airworthiness-information-bulletins.html

EASA Safety Information Bulletins (SIB)
A European Aviation Safety Agency (EASA) SIB is an information tool that alerts, educates, and makes recommendations to the general aviation community. It is non-regulatory information and guidance that does not meet the criteria for an Airworthiness Directive (AD). They are posted on the Internet at: https://ad.easa.europa.eu/sib-docs/page-1

To view the most recently published EASA Safety Information Bulletins (SIB), click here or go to this website http://www.tc.gc.ca/eng/civilaviation/certification/easa-safety-information-bulletin.html

Equipment Airworthiness Directives (AD)
Transport Canada (TC) endeavors to send copies of new Airworthiness Directives (ADs), which are applicable in Canada to the registered owners of the affected products. Equipment/appliance ADs are often only distributed to our regional offices because the owners of aircraft affected by this type of AD are not generally known.

Aircraft Maintenance Engineers (AMEs) and operators of the affected products are encouraged to obtain further information or a copy of the ADs from their regional TC office, their local Transport Canada Centre (TCC), their Principal Maintenance Inspector (PMI), or from the Civil Aviation AD website.

To view the most recently published Equipment Airworthiness Directives (AD), click here or go to this website http://www.tc.gc.ca/eng/civilaviation/certification/equipment-airworthiness-directives.html

Service Difficulty Reports (SDRs)
Service Difficulty Reports are submitted by Aircraft Maintenance Engineers (AMEs), owners, operators and other sources to report problems, defects or occurrences that affect aircraft airworthiness in Canada.

To view the most recently published Service Difficulty Reports (SDRs), click here or go to this website http://www.tc.gc.ca/eng/civilaviation/certification/service-difficulty-reports.html