Feedback

Canadian Aviation Service Difficulty Reports

The following content was published between April 2, 2020 and July 7, 2020.The full accessible version of each article is available on the Feedback website.

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Heads up

Canadair, CL600 2B16 (601 3R)

New Tire Found With Metal Protruding From Sidewall

SDR #: 20180716012

Subject:

Minor edits have been made to the text below taken from the Service Difficulty Report's Problem Description. Transport Canada Civil Aviation reserves the right to edit for spelling, grammar and punctuation to increase comprehension.

Following the installation of a new tire on the aircraft main wheel during the tire inflation and pressure test, the maintenance personnel noticed a piece of metal protruding from the tire sidewall. When the tire was installed and prior to inflation, the piece of metal was not visible. The tire was a new part received from a supplier who had received it from the original equipment manufacturer (OEM).

Transport Canada Comments:

It appears that during manufacture of the tire, a piece of metal fell into the mold and was molded into the tire sidewall. The tire manufacturer's post-inspection requirements (Quality Control) did not detect the foreign object inside the tire sidewall. The defect was not discovered until the tire was inflated by maintenance personnel after installing the tire. The supplier and tire OEM were advised of this event by the operator and Transport Canada Continuing Airworthiness.

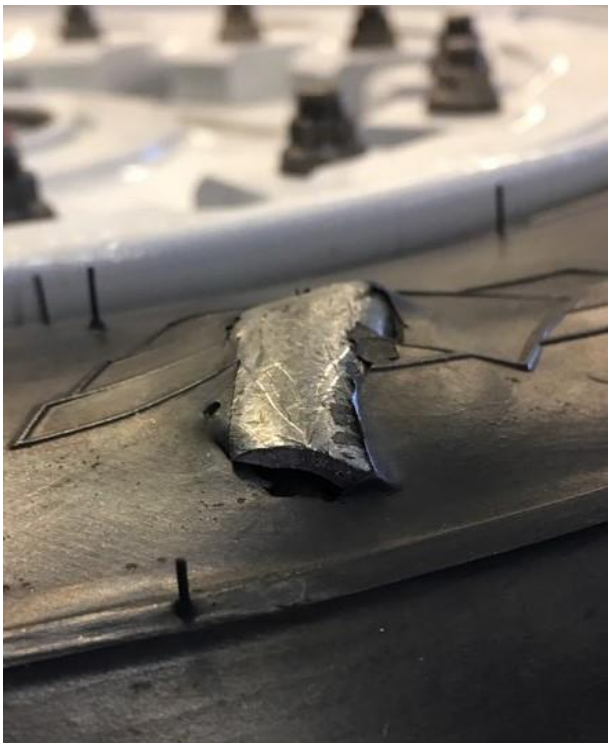


Fig 1: Metal showing after inflation close-up

Fig 2: Metal Protruding

Fig 3: Indications metal was molded into tire

Fig 4: Metal removed

Lockheed, L100-382

Wing Bolts Received New From Supplier Were Found Cracked Before Installation

SDR #: 20180706010 and 20180706012

Subject:

Minor edits have been made to the text below taken from the Service Difficulty Report's Problem Description. Transport Canada Civil Aviation reserves the right to edit for spelling, grammar and punctuation to increase comprehension.

A batch of bolts (part number (P/N) MS21250-12032) was procured in a lot of 50 for use as wing attachment bolts on a Canadian military CC130H Hercules aircraft. Prior to installation, the Royal Canadian Air Force (RCAF) technical order requires that the bolts undergo magnetic particle testing. During the magnetic particle testing, one bolt was found to be cracked longitudinally in the bolt head.

A batch of bolts (P/N MS21250-14038) was procured in a lot of 26 for use as wing attachment bolts on Canadian military CC130H Hercules aircraft. Prior to installation, the RCAF technical order requires that the bolts undergo magnetic particle testing. During the magnetic particle testing, four bolts were found to be cracked longitudinally in the bolt head.

The same bolts are used in civilian registered Lockheed L100-382 Hercules aircraft.

Transport Canada Comments:

Due to the pre-installation testing requirements for these wing attachment bolts, the defective bolts were discovered and not installed on the aircraft. As these bolts were installed in a critical component, the operator/military had additional inspection requirements before installation. This occurrence shows the importance of good quality control practices when using standard aviation hardware which can be procured from many suppliers.

This was a military aircraft and a military required inspection process that could be easily adapted for use on civilian registered Hercules aircraft and provide additional safety. Additional inspection requirements like this are a good safety practice when standard hardware is used in critical areas.

Figure 1. MS21250-12032 bolt showing area where crack was found

Fixed Wing

Airbus, A321 211

Loose External Receptacle Causes Hidden Fire

SDR #: 20190814001

Subject:

Minor edits have been made to the text below taken from the Service Difficulty Report's Problem Description. Transport Canada Civil Aviation reserves the right to edit for spelling, grammar and punctuation to increase comprehension.

Evidence of fire was discovered in the forward avionics bay caused by the ground power unit receptacle. Sparks from loose feeder 20xg terminal B were arrested by the blanket insulation between frames 7 and 8, and self-extinguished. The remaining soot was cleaned and the area was inspected. The external power receptacle was replaced.

Transport Canada Comments:

The operator of this aircraft was fortunate that the fire had extinguished itself and had not caused more extensive damage to other components. The crew was also fortunate that an emergency landing was not conducted. To confirm wear and tear of the external power receptacle, Airbus recommends performing the GO-NOGO test, Aircraft Maintenance Manual (AMM) Task 24-41-00-220-801-A on an interval of 36 months/8000 Flight Cycles.

Pic 1: Evidence of fire. Soot present on wiring and structure.

Pic 2: Shared receptacle cover.

Boeing, 737 86J

Burnt out Logo Light

SDR #: 20190107009

Subject:

Minor edits have been made to the text below taken from the Service Difficulty Report's Problem Description. Transport Canada Civil Aviation reserves the right to edit for spelling, grammar and punctuation to increase comprehension.

Intermittent Flight Data Recorder (FDR) light caused by burnt Logo Light connector and receptacle. Extensive troubleshooting found that the FDR fault only happens when the Logo Light is turned to on position. Horizontal stab connector D40190 was checked and found that the receptacle and the connector were toast.

The following parts were replaced and no further occurrences were reported: Connector Part Number (P/N): BACC63BP14C12SN, receptacle P/N: BACC63BV14F12PN.

Transport Canada Comments:

As maintenance personnel, additional consideration must also be given to the operating environments that may cause early buildup of corrosion. Electrical connectors and receptacles often hide the defect until the unit arcs and creates a fault. Please follow your aircraft's corrosion prevention and control program for appropriate methods to avoid such a snag.

Pic 1: Evidence of arcing and soot on the connector pins

Pic 2: Melted receptacle

Bombardier, CL600 2D15 (705/900)

RJ900 – Windshield Heater Arcing at Terminal Block and Subsequent Window Cracking

SDR #: 20171124012

Subject:

Minor edits have been made to the text below taken from the Service Difficulty Report's Problem Description. Transport Canada Civil Aviation reserves the right to edit for spelling, grammar and punctuation to increase comprehension.

While enroute, the left windshield heater terminal block was reported smoking and arcing causing damage to the windshield. The crew turned the windshield heat off and advised maintenance and dispatch. The flight continued and landed without any further issue.

Maintenance discovered that the arcing had caused the windshield to crack and windshield replacement was carried out. Systems function and aircraft pressure checks carried out and aircraft returned to service.

Transport Canada Comments:

In many cases, cracking windshield events are caused by arcing of the heater elements or arcing at the terminal blocks. It has been found that water ingress has been the root

cause of many of these occurrences. As noted in the attached pictures, the foggy area near the terminal block denotes water ingress. The window sealant erosion is also evident and is likely that it did not keep the water out.

Maintaining the integrity of the window sealing should prolong the life of these cockpit windows by preventing ingress of moisture.

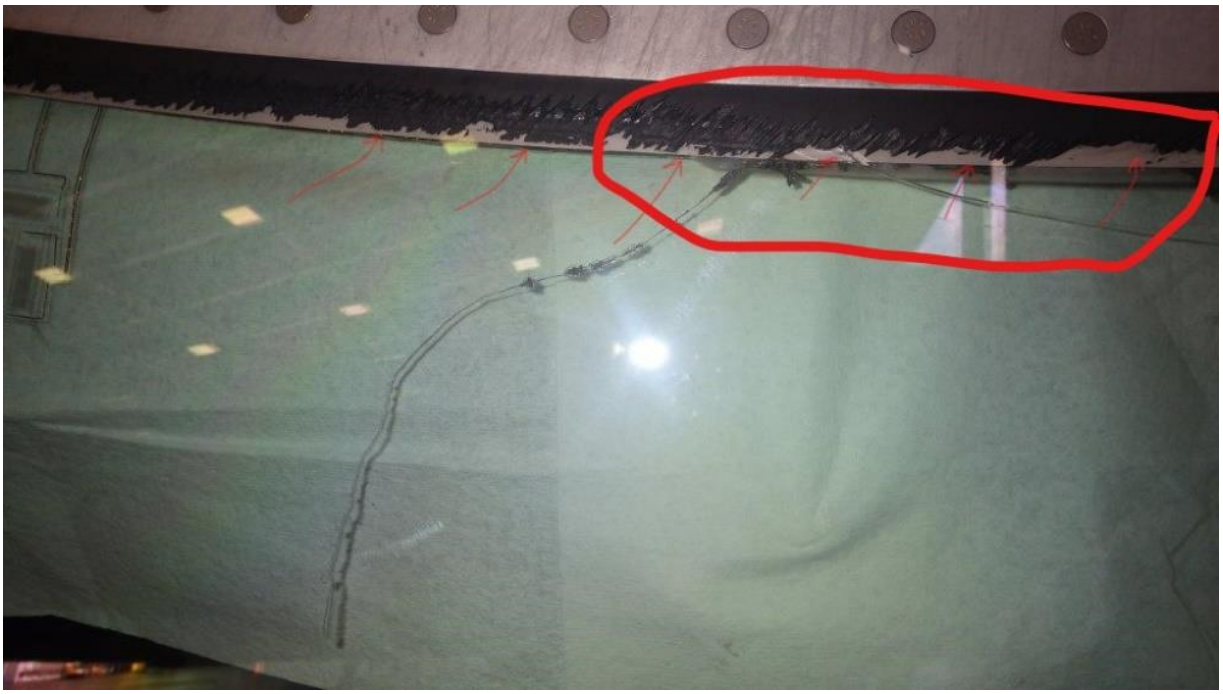


Figure 1. Window crack and red circle showing the foggy area of water ingress. Arrows show the worn away sealant that allowed the water to get in.

Figure 2. Cracking near terminal block and sealant eroded.

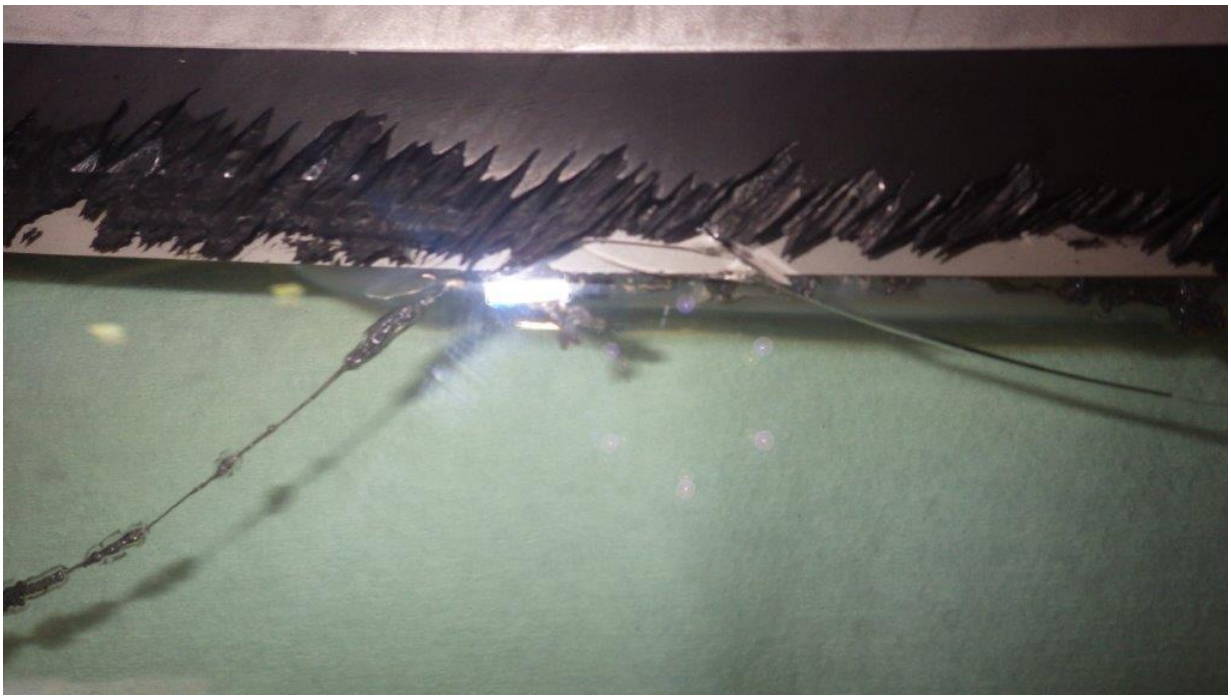


Figure 3. Close-up of foggy area and eroded sealant.

DeHavilland - CAN, DHC 8 301

Failed Aileron Pulley Bearing

SDR #: 20181019011

Subject:

Minor edits have been made to the text below taken from the Service Difficulty Report's Problem Description. Transport Canada Civil Aviation reserves the right to edit for spelling, grammar and punctuation to increase comprehension.

During heavy maintenance check, maintenance observed that the left-hand aileron cable circuit was off a pulley in the upper fuselage centre wing area and riding on the pulley retainer bolt. Further inspection showed that the bearing and centre body of the pulley had failed, allowing the pulley to tilt on the bolt, thus creating a loosening effect and allowing enough space for the cable to come off the pulley with the cable safety keeper still in place.

Transport Canada Comments:

A cable that has jumped of the pulley could cause the flight control to deflect from the neutral position and give the first indication that something is wrong. If the cable tension is low, inspect the whole control circuit and determine what is causing the cable tension to drop. It is very easy to miss that the cable has jumped off the pulley and it could cause a flight control jam in the most severe case.

Aileron cable riding between two pulleys

Pilatus - SW, PC12 45

Steering System Troubles

SDR #: 20190408007

Subject:

Minor edits have been made to the text below taken from the Service Difficulty Report's Problem Description. Transport Canada Civil Aviation reserves the right to edit for spelling, grammar and punctuation to increase comprehension.

While taxiing out from the hangar, the crew heard a loud bang as they were turning right. The right-hand rudder pedal went to the floor and the aircraft was unable to turn right without the use of brakes, however it was able to turn left.

The crew shutdown and the aircraft was towed back to the hangar. Upon inspection, it was discovered that the steering bolt that attached the fork bearing to the fuselage mounting bracket had sheared off.

The steering bolt, fork bearing, bracket and attachment bracket were replaced and new hardware installed. Aircraft returned to service with no further faults found.

Transport Canada Comments:

The crew of this aircraft was fortunate that the component bolt failed on the ground and not while in-flight. Pilatus has no lubrication schedule set for this bolt but has set a 600hr inspection interval for the steering components.

This submission is an excellent example of a Service Difficulty Report (SDR).

From the Canadian Aviation Regulations (CARs) Part 1, Subsection 1, Interpretation 101.01:

Service difficulty *means a failure or malfunction of, or defect in, an aeronautical product;*

Reportable service difficulty *means a service difficulty that affects or that, if not corrected, is likely to affect the safety of an aircraft, its occupants or any other person.*

Please consult the CARs Part 5 Division IX for reporting requirements and timelines. You may also reference Advisory Circular (AC) 521-009 available as a link on Web Service Difficulty Reporting System (WSDRS). The AC is an excellent tool for guidance on SDR submission.

Pic 1: Sheared bolt in assembly

Pic 2: Sheared bolt

Engines

Teledyne Continental, TSIO-360-EB1

Broken Cotter Pin

SDR #: 20190521033

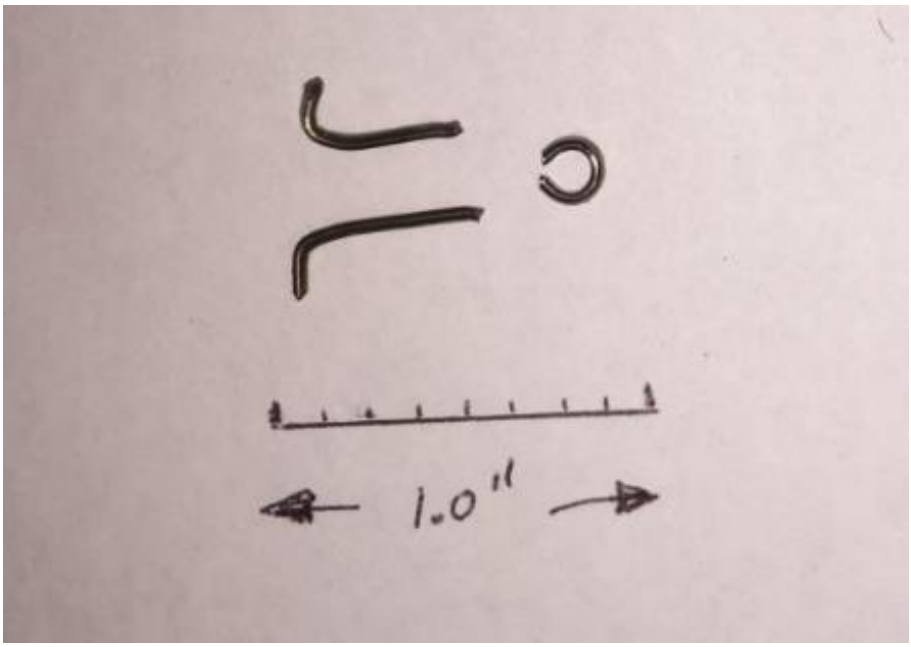
Subject:

Minor edits have been made to the text below taken from the Service Difficulty Report's Problem Description. Transport Canada Civil Aviation reserves the right to edit for spelling, grammar and punctuation to increase comprehension.

During routine maintenance, a piece of metal was found in the left-hand (L/H) engine oil sump screen. Further investigation found that the cotter pin installed into the #4 cylinder connecting rod bolt had broken. The head of the cotter pin was the piece of metal found in the oil sump screen and the remainder of the cotter pin was found still installed in the bolt/nut. The cotter pin's remnants were removed, and the torque of the nut was checked and found to be within the specified range. Had the connecting rod bolt/nut loosened, the results could have led to failure of the engine.

Transport Canada Comments:

Although the sump screen performed as intended and prevented metal from entering the oil system, it may have been much worse had the nut backed off the connecting rod. Maintainers must be thorough when performing maintenance and adhere to Canadian Aviation Regulations (CARs), Instructions for Continued Airworthiness (ICAs) or standard industry practices (AC43-13-1B) as applicable. The cause of this cotter pin's failure was not identified, however repetitive use, improper size or incorrect installation procedures are known contributing factors to broken cotter pins. Never reuse cotter pins and ensure you have the proper size for the application by verifying the correct part number from the Illustrated Parts Catalog (IPC).



Cotter pin remnants

Rotorcraft

Bell Textron - CAN, 505

Effects of Overfilling Engine Reduction Gearbox Oil

SDR #: 20190911012

Subject:

Minor edits have been made to the text below taken from the Service Difficulty Report's Problem Description. Transport Canada Civil Aviation reserves the right to edit for spelling, grammar and punctuation to increase comprehension.

It was reported to Bell that a helicopter was flying in hover 0.2 hours after the completion of TF90 inspection when the pilot observed high engine oil temperatures and zero engine oil pressure. (The engine accessory gearbox reportedly got so hot that it bubbled the sealant used to seal the top of the freewheel housing to engine gearbox interface). The helicopter landed without incident. A preliminary inspection revealed that the engine oil tank was full and no loss of oil was observed. The engine manufacturer was notified and initial thoughts suggest that the engine oil pump had failed.

Transport Canada Comments:

The conditions experienced in this Service Difficulty Report (SDR) have been attributed to excess oil in the engine reduction gearbox. As part of the investigation conducted by Bell and Safran HE, Information Letter 505-IL-19-05 was published to share information about the current findings. The Information Letter has a list of possible conditions if excess oil is present in the engine reduction gearbox. The letter also directs readers to references of existing procedures in the Rotorcraft Flight Manual and Maintenance Manual to maintain the proper oil level.

Robinson, R44 II

Robinson R44 II Throttle Link

SDR #: 20190423010

Subject:

Minor edits have been made to the text below taken from the Service Difficulty Report's Problem Description. Transport Canada Civil Aviation reserves the right to edit for spelling, grammar and punctuation to increase comprehension.

During run up, it was noted that the idle was high (around 70% belts engaged). Upon inspection, it was found that the bearing had come out of the part number (P/N) B564-2 link at the servo end.

Transport Canada Comments:

It should be noted when inspecting or replacing throttle link P/N B564-2 for the R44 and R44 II model helicopters, that the Robinson Helicopter Company has published multiple service bulletins for this service difficulty.

R44 Service Bulletin (SB)-62 identifies a failed throttle link where the bearing separated from the housing. Compliance with this SB involves the installation of a large-diameter washer to prevent loss of control if a bearing fails. The incorporation of the large-diameter washer is also published in the Robinson Illustrated Parts Catalog throttle control installation.

R44 SB-71 introduces a throttle link with a Teflon^{TM}-lined steel bearing race designed to prevent race separation from the link body. This SB requires replacing the earlier links having aluminum-bronze races while retaining the large-diameter safety washer requirement.

Figure 1: Pre R44 SB-71 throttle link P/N B564-2 having aluminum-bronze bearing races.

Figure 2: Post R44 SB-71 throttle link P/N B564-2 having Teflon™-lined steel bearing races.

Suspected Unapproved Parts (SUPs)

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.

FAA Unapproved Parts Notifications (UPNs)

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

To view the most recently published FAA Unapproved Parts Notifications (UPNs), 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). www.faa.gov/aircraft/safety/alerts/SAIB/

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EASA Safety Information Notifications (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). http://ad.easa.europa.eu/sib-docs/page-1

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

Equipment Airworthiness Directives (ADS)

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 (ADs), click here or go to this website http://www.tc.gc.ca/eng/civilaviation/certification/equipment-airworthiness-directives.html

Service Difficulty Reports (SDR)

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 (SDR), click here or go to this website http://www.tc.gc.ca/eng/civilaviation/certification/service-difficulty-reports.html