Feedback

Canadian Aviation Service Difficulty Reports

The following content was published between July 1, 2021 and September 30, 2021.The full accessible version of each article is available on the Feedback website.

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Hangar noise

Bombardier, CL600 2D24 (RJ900)

RJ 900 Slat Damage Found During Maintenance

SDR #: 20190924002

Subject:

During unrelated scheduled maintenance, a deep gouge was observed in the upper portion of the left-hand #2 slat assembly. The damage was caused by a leading edge screw that had backed out and interfered with the trailing edge of the slat during retraction. A check of the maintenance records indicated that there have been several incidents resulting in similar damage to the slats on this aircraft type.

Transport Canada Comments:

The screw that backed out and damaged the slat is located under the slat and is out of view when the slats are retracted. These screws thread into anchor nuts, so whenever they are removed and replaced, the condition of the anchor nut should be confirmed. Upon reinstallation, the proper torque should be applied to ensure these screws do not come loose.

As seen by the damage to the screw head, the loose screw went through many slat up and down cycles before damaging the trailing edge. As the screw loosened, it would likely have marked the bottom of the slat before gouging the trailing edge.

More frequent and/or detailed inspections may be required to find these loose fasteners before they cause slat damage.

Figure 1: Slat showing location of damage in trailing edge

Figure 2: Close-up of slat damage

Figure 3: Underside showing anchor nuts

Figure 4: Damaged screw head missing

Pilatus, PC12 47E

Deteriorated Clamp Found before Failure

SDR #: 20210303003

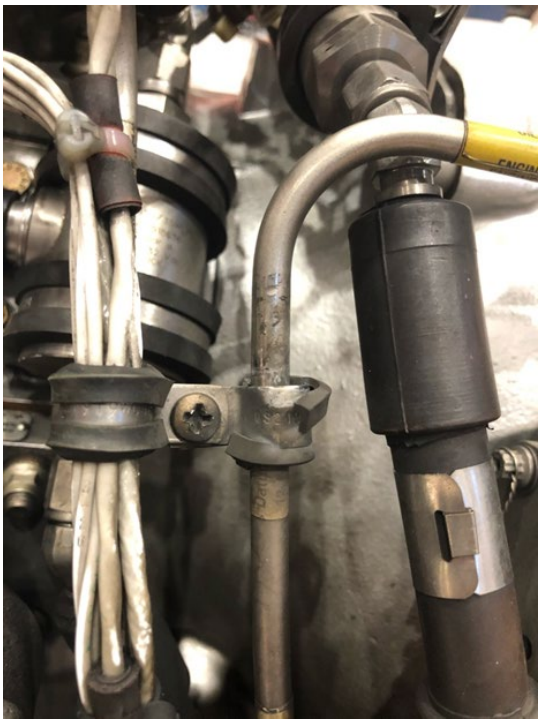
Subject:

The issue was found during a function check of the stick pusher system. It was noticed that the torque transducer pipe assembly (oil line) Pilatus Illustrated Parts Catalogue (IPC) 12-B-77-10-00-010-941A-A item 15 pre-Service Bulletin SB-77-005 attaching upper Adel clamp rubber, appeared in poor condition but was still attached. It was pulled at the rubber portion slightly, and the rubber had worn through from the metal of the clamp and showed signs of chafing in the line. The clamp was removed to inspect further, and it was found chafed beyond limits. The oil line and both adjoining Adel clamps were replaced. The leak checks were completed. Note. If the line had failed, there would have been a potential for loss of propeller control.

Transport Canada Comments:

This Service Difficulty Report (SDR) is an excellent example of reinforcing the importance of being vigilant while performing maintenance tasks and inspections. This maintainer was able to identify the deteriorated clamp and replace it along with the oil tube before a failure occurred.

Remember that clamps and similar hardware are on-condition. It may only take a few minutes to prevent a failure.



Picture 1 – Damaged clamp attached to tube on the engine

Picture 2 – Clear damage caused to oil tube by clamp

Picture 3 – Deteriorated clamp

Heads up

Canadair, CL215 6B11 (CL415)

Blocked Vent Openings

SDR #: 20210719024

Subject:

The aircraft was dispatched to a forest fire on 17 July 2021. After start up, the flight crew found the right-hand (R/H) low fuel pressure light on. The aircraft was shut down and the snag was reported to maintenance.

The Aircraft Maintenance Engineer (AME) attempted to troubleshoot the aircraft system, but upon selection of the #2 battery to the ON position, no power was observed on the aircraft. Subsequent troubleshooting of the #2 battery system revealed that the #2 battery case was distorted and the battery lid was bent. The battery was removed from the aircraft for further inspection.

There does not seem to be any evidence of the battery overheating, and the battery was cool when the defect was found. The battery voltage still read 24-25 volts. Removal of the battery lid revealed that the thermal switch was defective with an internal short or other failure. We can also see that one of the cells within the battery was cracked.

We have completed the initial inspection of the aircraft, and have found the pressure portion of the battery vent system plugged (insect). We have been in contact with the aircraft manufacturer (Viking) and have been trying to contact the battery manufacturer to address the cause of the distorted case. All other aircraft in the fleet have been inspected for battery case distortion, and no thermal switches with defects were found. The battery vent systems of the fleet have also been inspected and cleared of any obstructions.

Transport Canada Comments:

This particular defect was found on the ground but could have been worse if it had been found during flight. Transport Canada Civil Aviation (TCCA) would like to remind operators, maintainers and ground service personnel of the importance of being vigilant for possible ingress of dirt, insects etc. in aircraft systems vent openings. The latter would include, without limitation, pitot-static openings, fuel system vents and, as in this case, battery venting openings. Obstructions of venting provisions on an aircraft can lead to more serious problems.

Defective battery

Fixed Wing

Bombardier, CL600 2D24 (RJ900)

Passenger Door Structure Found with Level 2 Corrosion

SDR #: 20190930017

Subject:

During scheduled maintenance, level 2 corrosion damage beyond allowable limits was observed on the forward former of the passenger door assembly at fuselage station (FS) 317. The damaged area was cut out and replaced with a new section of former, and the repair work was accomplished in accordance with approved repair engineering order (REO) 690-52-11-582.

Transport Canada Comments:

The passenger door serves as the main entrance stairs to board and deplane the aircraft. It is often open to the elements and is subject to snow, ice, rainwater and many compounds that can be deposited by passenger footwear when using the stairs. This makes it an area that requires frequent inspections, frequent cleaning and recurring applications of corrosion inhibiting compounds (CIC) to prevent corrosion.

Transport Canada is not aware of the actual inspection interval frequency for this task for this operator. The service difficulty report did not indicate that a localized corrosive spill caused the corrosion, so this finding of level 2 corrosion suggests a more frequent inspection interval is likely needed and should be applied to this area.

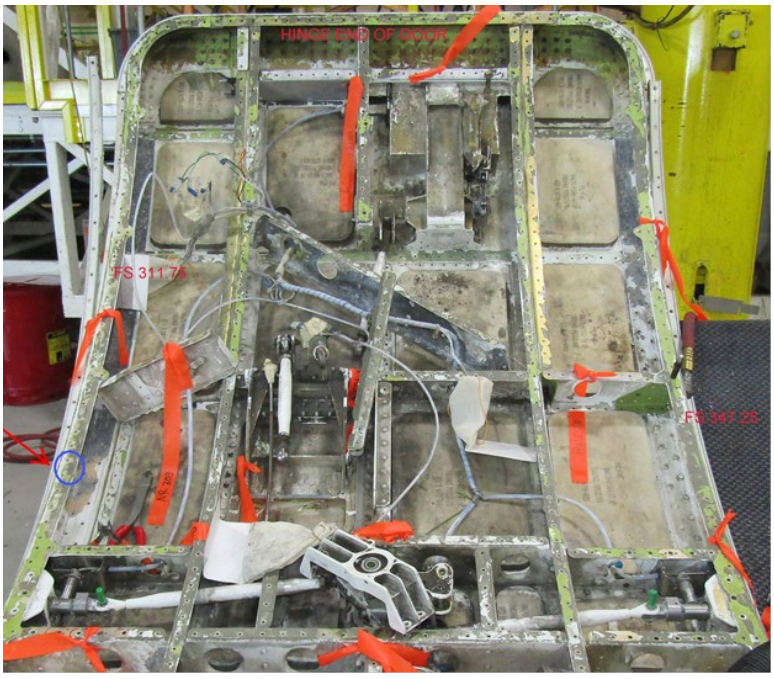


Figure 1: Forward frame location with damaged area circled in blue

Figure 2: Frame showing corroded area

Figure 3: Close-up of corrosion

Engines

AVCO Lycoming, IO-540-K1B5

Continental Aerospace Technologies (Bendix / TCM) S-1200 Series Magneto Mounting Flange Loose

SDR #: 20210326007

Subject:

After flight, oil was observed to be leaking from the left engine. The Aircraft Maintenance Engineer who inspected the engine found the magneto to still be firmly fastened to the engine, but its case had split at a swaged joint, allowing oil to leak from the resultant gap.

Transport Canada Comments:

It was confirmed that all 3 internal wrenching screws part number (P/N) 10-349652, which secure the flange to the body of the magneto, were found loose. S-1200 series magnetos, which include 4, 6 and 8 cylinder models all use this method of attaching the flange to the body of the magneto.

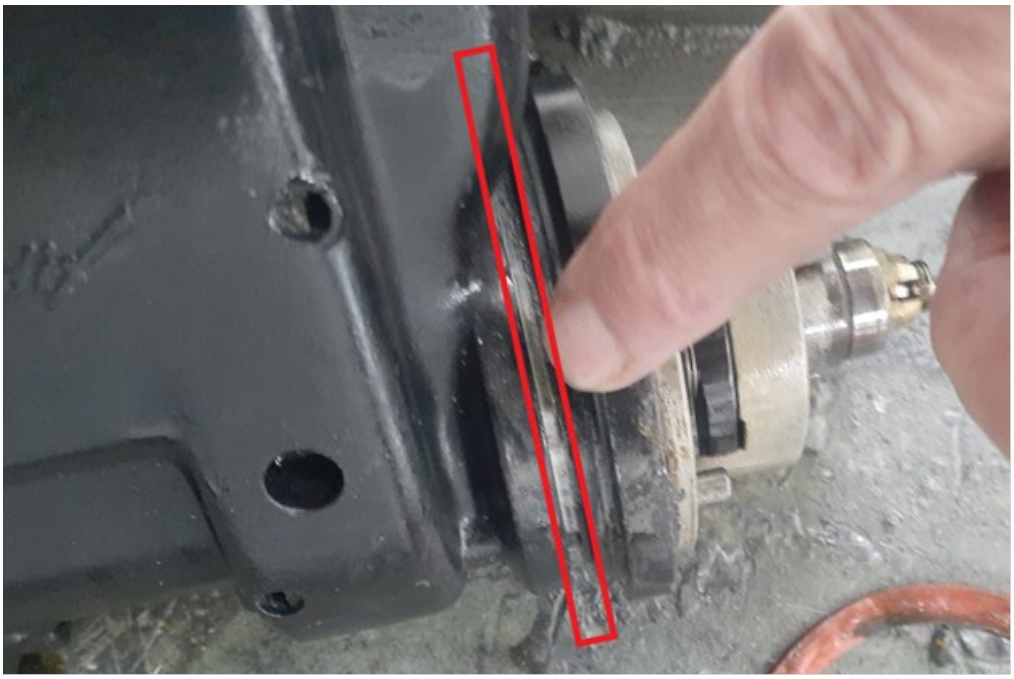
Possible scenarios involving loose or fully migrated P/N 10-349652 screws include: oil leak, metal contamination of engine oil system or magneto failure.

Service Difficulty Report (SDR) data indicates this event is not a trending defect, the majority of related occurrences were prior to 1997. The inclusion of the following

information in the S-1200 Series Service Support Manual may have played a role in mitigating a continuing airworthiness concern.

Multiple notes and warnings are included in the published service manual, stating to remove and discard the flange securing screws and washers, regardless of whether disassembly is for the purpose of inspection, parts replacement, or overhaul. Additionally, adherence to published fastener torque specifications is highlighted.

A daily pre-flight check may not specifically include checking for security of attachment of the magneto, although including such an item may be beneficial.



Flange to body – Split line gap highlighted

Pratt & Whitney-CAN, JT15D-4B

Improper Igniter Cable Routing

SDR #: 20201215004

Subject:

At take-off, the crew advanced the throttle, and while adjusting the right-hand engine to the correct power rating, the right-hand throttle lever became jammed. The crew aborted the take-off and vacated the runway normally. The left-hand engine was shut down normally to limit thrust during taxiing. A moment later, the right-hand aircraft brake failed and spun the aircraft off the taxiway. While the crew was trying to unstick the right-hand throttle, the thrust reverser inadvertently deployed, and dust/dirt entered the

cabin. The crew had to shut down the right-hand engine using the firewall shut-off valve. The source of the throttle jam was found to be an engine igniter cable not routed properly on the engine, which interfered with the throttle cable.

Transport Canada Comments:

The importance of security and proper routing of lines, cables, bundles etc. cannot be stressed enough. With the confined areas of some aircraft, it may seem impossible to ensure that no chafing or interference of moving parts exist.

In this event, the root cause was determined as improper routing of the ignition cable. This may seem like a human factors error; however, it may have made sense to install the cable in such a way as to avoid interference with other lines or bundles. Luckily this event ended without incident; however, had the event occurred during flight, the outcome may have been much worse.

When carrying out such tasks, please follow the manufacturer's instructions and if there are doubts or concerns about the security or proper routing, contact the manufacturer for verification. Always check clearance of moving parts when routing bundles, lines or cables to ensure no interference with controls.

Pratt & Whitney-CAN, PW127M

Fuel Nozzle Transfer Tube Missing O-Ring

SDR #: 20210326013

Subject:

The customer reported an excessive fuel leak from the left engine drain mast after engine start. This happened after the first flight since the fuel nozzles were replaced. The customer identified a missing O-ring from the #4 fuel nozzle transfer tube. The O-ring was installed and the aircraft returned to service after a ground run check.

Transport Canada Comments:

Many maintenance tasks involve mundane procedures that require repetitive actions. The replacement of fuel nozzles is one such task that involves the removal of old and installation of new O-rings on numerous transfer tubes, depending on the engine model.

In this event, an O-ring was found missing from a transfer tube causing a fuel leak. Fortunately, this was detected on engine start prior to flight. Had the leak occurred during flight and ignited, it may have had a much worse outcome.

Complacency caused by repetitive tasks, distraction from the job at hand, fatigue, and the pressure to get the job done are all possible factors that can lead to such events. Aircraft maintainers face significant threats to maintaining diligence when carrying out any type of work, but the threats related to repetitive activities are elevated. Being

aware of possible human factor errors, and recognizing when they are most likely to affect one's performance, are essential skills for any aircraft maintainer to master.

Pratt & Whitney-CAN, PW305A

New Bleed Valve Solenoid

SDR #: 20201005017

Subject:

During taxiing for take-off, the crew saw the left engine inter-turbine temperature (ITT) climb to 885oC, the low oil pressure annunciator illuminated, and the crew immediately shut down the engine and taxied back to the fixed base operator (FBO).

Transport Canada Comments:

Transport Canada Civil Aviation (TCCA) has received numerous Service Difficulty Reports (SDRs) related to compressor bleed valves on Pratt & Whitney Canada (P&WC) models PW305A, PW305B and PW306A engines.

The purpose of this Feedback article is to raise awareness of P&WC Service Bulletin (SB) 25401R7 and SB 24645R6. These SBs introduce a new bleed valve solenoid valve to improve the durability of the compressor bleed valve. Reference P&WC Service Information letter (SIL) PW300-198, which advises operators of these SBs.

TCCA encourages operators to follow all manufacturers' recommendations and consider implementing these SBs in the interest of safety.

Rotorcraft

Aerospatiale HC, AS 350B2

Starter Generator Updated Overhaul and Time Between Overhaul Schedule

SDR #: 20210215012

Subject:

Starter generator driveshaft sheared during start attempt.

Transport Canada Comments:

Airbus Helicopters published service bulletin (SB) No. AS350-80.00.12 providing a modified schedule for the next overhaul of installed and non-installed starter generators. The SB also introduces a calendar limit to the time between overhaul (TBO). A review of the SB is required to determine the overhaul compliance limit established by the starter generator part number and the production or latest overhaul date. Transport Canada

Civil Aviation (TCCA) recommends that operators review the SB for potential updates to their scheduled starter generator overhaul and TBO limits.

Airbus Helicopters, AS 350B2

Tail Rotor Gearbox Chip Light

SDR #: 20200326017

Subject:

During ground runs, after a scheduled 600 hour airframe inspection of an Airbus AS350 B2, a tail rotor gearbox chip light indicated on the warning panel. The procedures in the Aircraft Maintenance Manual (AMM) were followed, and the chip plug and the oil were inspected for chips and particles. The recovered particles and chips were classified, and four were found to be over the 2mm length limit as described in the AMM. As prescribed in the AMM, the particles have been sent to a lab for metallurgical analysis. Depending on the results, the gearbox may either be operated "monitored in service" or the gearbox must be sent for overhaul.

Transport Canada Comments:

As a reminder of the importance of collecting, characterizing and following up on particles in dynamic component lubricating systems, Airbus Helicopters recently published Safety Information Notice (SIN) No. 3638-S-63. The purpose of this SIN is to raise awareness of implementing strict monitoring of the dynamic assemblies to detect emerging degradation and therefore preventing the extension of its damages. The SIN provides instructions and references to the latest updates included in the AMM specific to each type of helicopter. Airbus Helicopters has also published Information Notice (IN) No. 3586-I-00 to provide notes about oil analysis and the laboratories capable of performing the analysis. Use of the instructions provided in the IN and SIN has a potential to reduce the degradation in the safety margins of the dynamic assembly over time, as well as ease repair costs by limiting the damages to surrounding parts.

Bell Textron - CAN, 429

Bell 429 Main Rotor Transmission Debris Pan Inspection

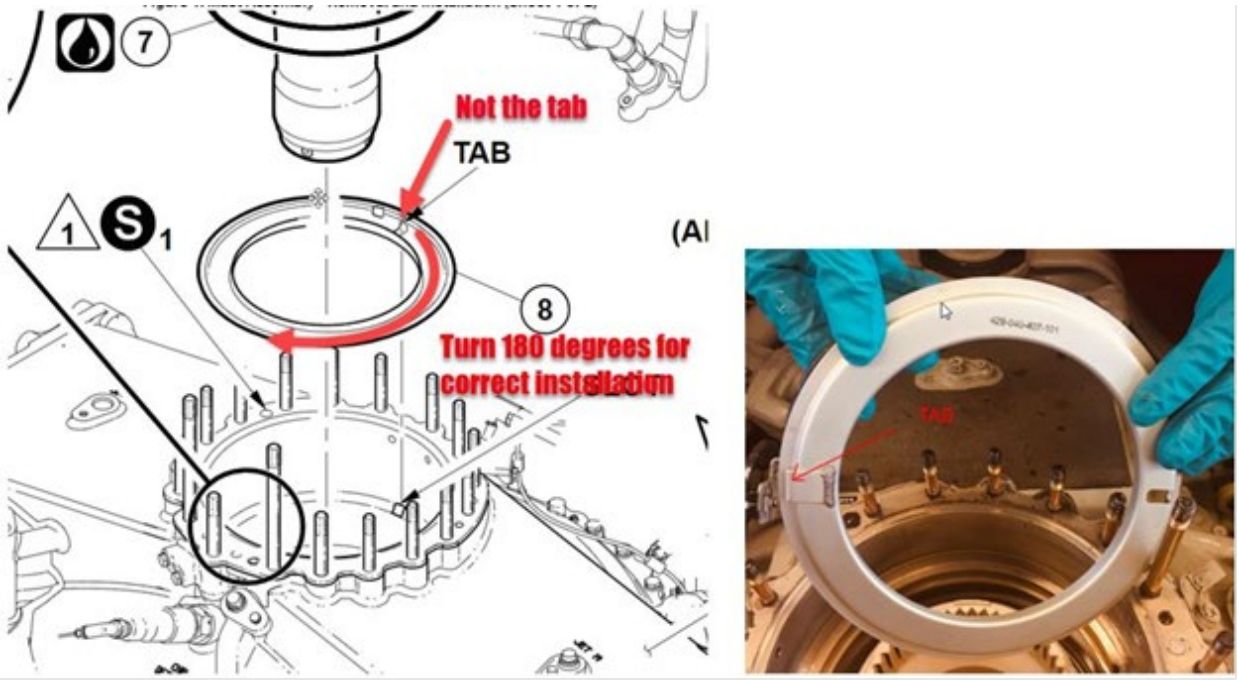
SDR #: 20210219018

Subject:

An operator found one debris pan incorrectly installed, which could prevent the mast chip detector from detecting metal contamination from the mast bearing. After Bell investigated, it was found that the maintenance procedure was clear and accurate, however the figure in support of the procedure could be misleading. Consequently, the maintenance manual figure will be updated to avoid repeating such an issue.

Transport Canada Comments:

The debris pan has a tab and a cutout, an incorrect installation of the debris pan is when the tab of the pan is not properly aligned with the slot in the main rotor transmission. Following their investigation, Bell published Alert Service Bulletin (ASB) 429-21-54 to provide instructions for completing a one-time inspection, and a figure showing the correct installation of the oil debris pan. The ASB states that incorrect installation could result in the lubricating oil not being supplied to the mast chip detector and to the mast spline from the #13 oil jet. In addition to the ASB, Bell will be revising the potentially misleading figure currently published in the model 429 maintenance manual. Transport Canada, Civil Aviation (TCCA) encourages owners, operators and maintainers to review and accomplish ASB 429-21-54 to verify the correct installation of the debris pan.



An example of the current potentially misleading figure in the maintenance manual and the debris pan.

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