



Airworthiness Bulletin

AWB 02-048 Issue 8 – Effective date TBA

Compliance with Cessna Supplemental Inspection Documents (SIDs)

An Airworthiness Bulletin is an advisory document that alerts, educates and makes recommendations about airworthiness matters. Recommendations in this bulletin are not mandatory.

1. Effectivity

All Cessna 100, 200, 300 and 400 series aircraft.

2. Purpose

This is an explanatory document for all owners, registered operators and maintainers of Cessna aircraft for the requirement to comply with Cessna Supplemental Inspection Documents (SIDs), to ensure the continued airworthiness of the affected Cessna aircraft.

“The function of the Supplemental Structural Inspection Program is to find damage from fatigue, overload or corrosion through the use of the Non-destructive Inspections (NDI) and visual inspections. The Supplemental Inspection Document (SID) is only for primary and secondary airframe components. Engine, electrical items and primary and secondary systems are not included in the SIDs document”.

This Airworthiness Bulletin should be read in combination with Aviation Ruling 01/2014 – Compliance with Supplemental Inspection Documents (revision date TBA) and also CASA exemption instrument EX32/22.

3. Updates since initial issue

CASAs current regulatory Philosophy, new development of proportionate and risk-based rules for each sector of the industry and significantly the policies developed for Part 43 for GA Maintenance have brought about needed changes to how CASA sees compliance with SIDs.

This AWB deals solely with Cessna SIDs but the same regulatory position could apply to similar “Supplemental” inspection documents for other aircraft manufacturers where no Airworthiness Directive exists.

With the re-issue of Aviation Ruling 01/2014 and significant amendment to the exemption instrument EX32/22, the following now applies;

Private owners/operators and aerial work operators can now make their own assessments of the SIDs instructions and the need to comply. As has always been the case, the primary responsibility for the aircraft’s airworthiness rests with the Registered Operator. Each operator must consider the relevance of any new or revised ICA, and SIDs are no



exception to this. The owner/operator should use the resources and maintenance people available to them and with consideration of the utilisation, age and general condition of their aircraft when making these assessments.

For the private/aerial work operators, this policy position allows flexibility regardless of the Maintenance Schedule that has been elected for the aircraft. Meaning, that regardless of election use of CAR 42A or 42B or 42C, full compliance of any of the SIDs will be at the informed discretion of the registered operator/owner and therefore not mandated by CASA unless an AD has been issued for a particular item. The words in the updated Aviation Ruling and exemption Instrument spell this out in legal terms.

Air Transport Operators (previously known as charter category ops) now approved under Part 135, will still need to comply with Cessna SIDs. This is detailed in the new exemption instrument and Aviation Ruling. However, there remains as carried over from the earlier instrument, some relief for the single engine Cessna aircraft operated in Air Transport (non-scheduled). This relief is in the form of the SIDs tasks for Landing Gear (ATA Ch 32 SIDs) and also 4 Service Bulletins (SBs) are mentioned that have been assessed more as product improvements and issues of reliability rather than being necessary for safety.

What have Service Bulletins got to do with SIDs compliance anyway?

It's worth noting that SBs are NOT SIDs and that none of the Cessna SIDs were published as SBs. The reason for the confusion and grey area here was because many of the SIDs documents did refer to previously issued SBs. The very referencing of SBs within the Cessna SIDs documents often caused confusion as to their mandatory nature - if or not the SBs were needed as part of the package of SID compliance. Initially CASA was slow to clarify as to what was meant by determining that all SIDs are mandatory. We can now clarify that the intent of CASA SIDs compliance was never meant to include documents and tasks that were incorporated by reference for a product improvement or reliability reasons. Incorporation of these SBs are not directly related to SIDs compliance.

So, are SIDs not important anymore?

SIDs are actually very significant documents for the managing of continued airworthiness for the ageing legacy Cessna aircraft. They were developed by Cessna and with the encouragement and support of the FAA for this specific purpose.

Important and significant as they are, that doesn't translate into meaning mandatory compliance of each SIDs task as the only way for maintaining an aircraft's airworthiness.

Airworthiness Directives (AD) will continue to be issued for these aircraft when CASA or the FAA (as State of Design for Cessna) become aware of an unsafe condition that is likely to exist.

4. SID requirements and inspection intervals

The Cessna SID inspection document is an extensive document that requires research to extract the applicable individual SID inspections and intervals for each relevant aircraft.

Although highly recommended, CASA does not consider landing gear and attachments to be Principle Structural Elements (PSE) for the purposes of compliance with the SIDs. This



was a deliberate action intended to provide a measure of relief to industry (Exemption instrument EX32/22 gives authorisation).

The requirement to undertake a SID inspection is triggered whenever an applicable Total Time In Service threshold i.e. 10,000 hours, or a calendar based threshold i.e. 20 years has been reached – whichever occurs first.

The SIDs document explains how to identify the aircraft's operating environment and operating usage to correctly determine the inspection program necessary. Some aircraft will need to follow the inspection interval for SEVERE and others for MILD/ MODERATE.

Some of the SIDs use the figure of 12,000 flight hours (as an example) as the threshold for beginning the "detailed inspection" which calls for the NDT (typically Eddy Current) procedures. Therefore any aircraft beyond 12,000 flight hours must have these NDT inspections completed within the CASA compliance period.

Modification kits mentioned in SIDs are not required unless defects are found that require rectification or as a terminating action to repetitive inspections

Some of the SIDs start with statements;

"Review the aircraft records to determine if SK172-147 to the forward cabin doorpost has been installed. If SK172-147 has been installed, this inspection is complete".

Where statements like this exist the intent is that the visual inspections must be done and continued until the Service Kit (SK) or approved alternative is fitted. In most cases the SK also becomes the approved method of repairing the structure where cracks or defects are found.

Therefore the SK is only required when:

- cracking or defects are found, or
- as terminating action for the repetitive inspections (in this case each 1,000 hours/3 years).

CASA does not expect aircraft that are awaiting service kits to be grounded until the service kit arrives, unless the damage/cracking is to the extent that requires rectification/repair.

Where an existing Airworthiness Directive overlaps with a SID inspection, the AD takes precedence.

As with all ICAs, operators, owners and maintainers need to be aware that from time to time Cessna will issue revisions to the SIDs program in the form of temporary revisions to the maintenance manuals or a revised maintenance manual that may affect their compliance with the SIDs program.

5. Corrosion Prevention and Control Program (CPCP)

The SID document contains inspections for corrosion and fatigue, including the Cessna CPCP, however, there is flexibility in the way in which each operator implements the CPCP program for their aircraft in relation to SIDs compliance. The program can be adjusted for the aircraft operating environment and maintenance intervals.

The CPCP “baseline program” contained within the SIDs documents provides a good starting point and actually gives some credit towards the ongoing (repeat) SIDs intervals that have calendar time specified. Read Note 1 in section 2A-14-00 of SIDs document for details.

6. Background to SIDs

Every aircraft, Cessna or otherwise, ages from its day of manufacture. However, the rate an individual aircraft ages depends on how that particular aircraft has been operated, maintained and stored over its life. Every aircraft will age in a unique manner depending on its own circumstances.



Figure 1. Centre Rudder Hinge Mount Corrosion

Older aircraft (the average age of the Australian piston engine aircraft fleet is approximately 40 years), were built to the design, certification and maintenance standards applicable at the time. Many individual aircraft have now been operated well beyond the manufacturer’s original design service goals.

In many cases limitations existed in the fatigue life assessments, corrosion protection coatings, production methods and anticipated operational profiles and roles for the aircraft produced, particularly in relation to General Aviation (GA) aircraft.

These older aircraft are not necessarily unsafe (chronological age of an aircraft is only one factor impacting the airworthiness of an aircraft), however, this is provisional on the maintenance program being adapted to take into account the ageing process of that aircraft over time.



Figure 2. Cessna 172 Channel Splice

As a result of the growing concern of the safety of their increasingly ageing fleet, Cessna and the Federal Aviation Administration (FAA) commenced work on the SIDs Development Program for their products in the late 1990s. Comprehensive engineering studies were conducted by Cessna and the US Department of Transport commencing with the Cessna Model 402¹.

1. DOT/FAA/AR-98/66 Supplemental Inspection Document Development Program for the Cessna Model 402.

These studies, progressively undertaken across all Cessna piston engine aircraft, were based on operational data and feedback surveys from the world-wide aircraft fleet, including that of defect reports, service-life simulations of actual flight profiles and feedback from operators, owners and National Aviation Authorities (NAAs).

The investigations identified critical areas of Principal Structural Elements on the aircraft that have been proven, through service-life experience, to be susceptible to fatigue or corrosion damage. In some cases, these PSEs have not been seen, disassembled or inspected since the aircraft was manufactured as long as 40 years ago or more.

The SIDs programs provide an inspection regime to ensure the structural integrity of the airframe is maintained. These supplemental inspections complement those inspections undertaken during existing scheduled maintenance activities.

In addition, the SIDs also introduce fixed retirement lives for each aircraft model series, beyond which the continued airworthiness of the aircraft can no longer be assured (refer to the applicable SIDs document for the particular Cessna model).



7. SIDs compliance has ongoing requirements

As per CASA SIDs compliance policy for those aircraft in Air Transport operations (Charter cat), the requirement to undertake the Cessna SIDs includes the “repeat” inspection intervals. The SIDs program, for these aircraft, needs to be included irrespective of the elected or approved maintenance schedule for the aircraft.

Principle Structural Elements (PSE) of the airframe can be classified in the following manner:

- The component contributes significantly to carrying flight and ground loads *, and
- If the component fails, it can result in catastrophic loss of the airframe.

Typical examples of PSEs (from SIDs document section 2A-13-00) include:

Wing and empennage:

- Control surfaces, flaps and their mechanical systems and attachments (hinges, tracks and fittings),
- Primary fittings,
- Principal splices,
- Skin or reinforcement around cut-outs or discontinuities,
- Skin-stringer combinations,
- Spar caps, and
- Spar webs.

* Although highly recommended, CASA does not consider landing gear and attachments to be PSE for the purposes of compliance with the SIDs. This was a deliberate action intended to provide a measure of relief to industry.

Fuselage:

- Circumferential frames and adjacent skin,
- Door frames,
- Pilot window posts,
- Bulkheads,
- Skin and single frame or stiffener element around a cut-out,
- Skin and/or skin splices under circumferential loads,
- Skin or skin splices under fore and aft loads,
- Skin around a cut-out,
- Skin and stiffener combinations under fore-and-aft loads,
- Door skins, frames and latches, and
- Window frames.
- Engine support structure and mounts.

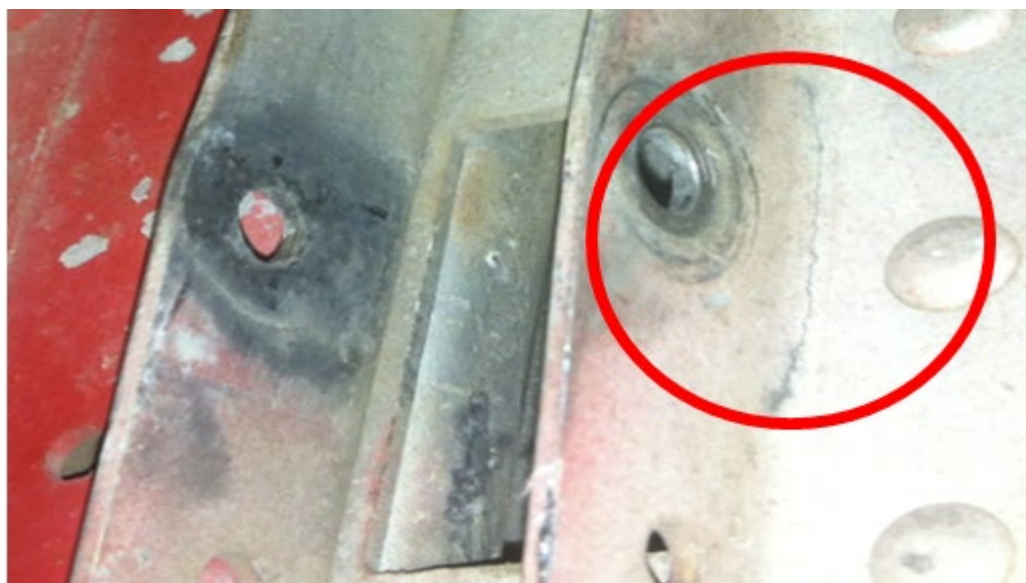


Figure 3. Cessna 177RG Stabiliser Balance Arm Brackets

For aircraft that have been modified or repaired in a manner different to the Cessna SBs/Service Kits, the engagement of a CASR 21.M Authorised Person may be required to ensure that the impact of any changes to the aircraft's original design and on the ability to comply with the SIDs are considered and appropriately addressed.



Figure 4. Cessna 152 vertical fin corrosion

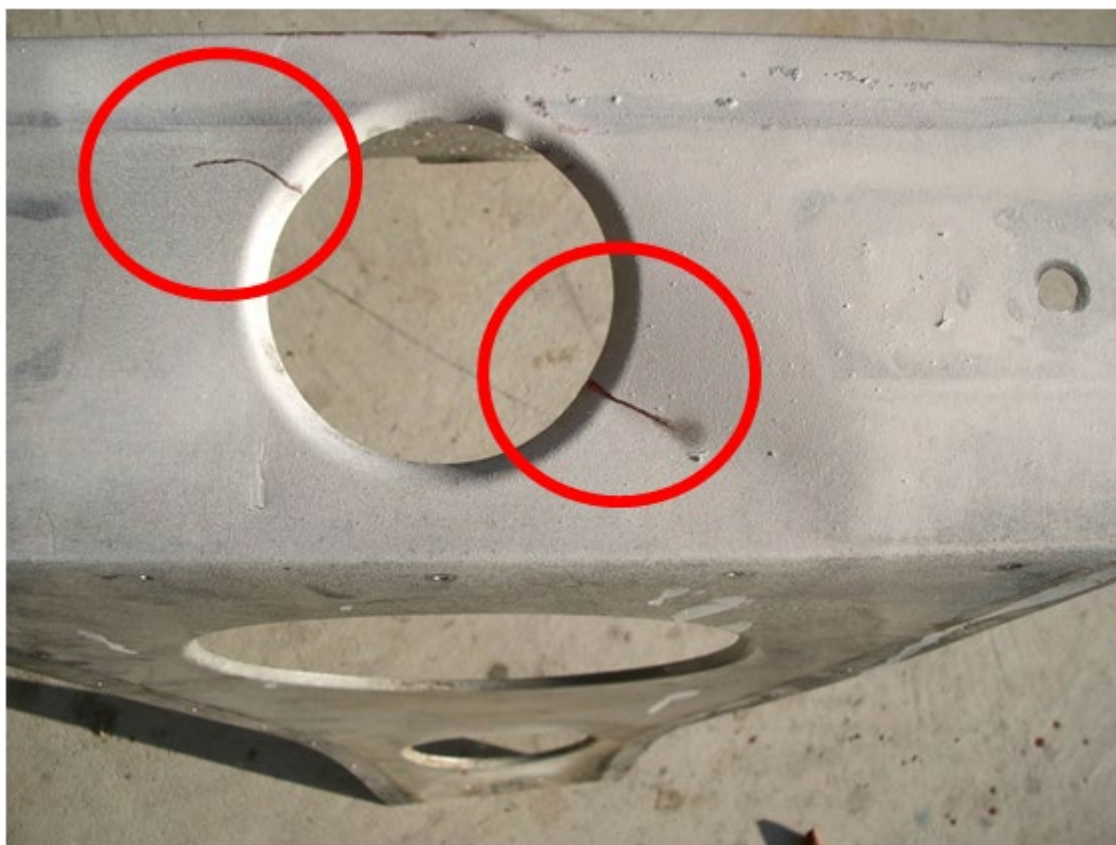


Figure 5. Cessna 172 Horizontal Stabilizer Front Spar Cracking

8. Certifying for SIDs compliance and defect reporting

Final certification for the completion of each required SID inspection task together with any rectifications/repairs carried out is required to be made in the Aircraft Maintenance Log Book (CASA Form 924 or equivalent).

Any significant damage or corrosion discovered during the SIDs inspections or repairs should be reported to CASA and to Cessna.

It is a requirement under CAR 51 and CAR 51A for the Registered Operator and/or those engaged in the aircraft maintenance to report defects to CASA. [AC 20-06 v1.0](#) provides further details on Defect Reporting.



Figure 6. Cessna 182H Flap Well Rib

9. Enquiries

Enquiries with regard to the content of this Airworthiness Bulletin should be made via the direct link email address:

AirworthinessBulletin@casa.gov.au

or in writing, to:

Airworthiness and Engineering Branch
National Operations and Standards
Civil Aviation Safety Authority
GPO Box 2005, Canberra, ACT, 2601