



Australian Government

Australian Transport Safety Bureau

In-flight breakup involving PZL Mielec M18A Dromader, VH-TZJ

37 km west of Ulladulla, New South Wales, 24 October 2013

ATSB Transport Safety Report
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Interim – 23 December 2013

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Summary

On 24 October 2013, at about 0940 Eastern Daylight-saving Time, the pilot of a PZL Mielec M18A Dromader, registered VH-TZJ, took off from Nowra Airport to conduct a firebombing mission in the Budawang National Park about 37 km west of Ulladulla, New South Wales. At about 1004, while the aircraft was approaching the target point, the left wing separated. The aircraft immediately rolled left and descended, impacting terrain. The aircraft was destroyed by impact forces and the pilot was fatally injured.

Preliminary examination indicated that the left outboard wing lower attachment lug had fractured through an area of pre-existing fatigue cracking in the lug lower ligament.

This Interim Report was released in order to highlight a safety issue that had been identified after the release of the Preliminary Report on 2 December 2013. The safety issue is that operators of some Australian M18 Dromaders,¹ particularly those fitted with turbine engines and enlarged hoppers and those operating under Australian supplemental type certificate (STC) SVA521, have probably conducted flights at weights for which airframe life factoring was required but not applied. The report includes a Safety Advisory Notice to M18 operators about this safety issue.

The first sections of this report are the same as the Preliminary Report released on 2 December 2013. Additional information is contained in the Context (*Operation of the M18 Dromader at take-off weights above 4,200 kg*), Safety analysis, and Safety action sections regarding the safety issue.

The investigation is continuing and a final report is expected by October 2014.

¹ There are three main aircraft variants, the M18, M18A, and M18B, in addition to two-seat trainer versions. Throughout this report, 'M18' is used generically to refer to any of the three main variants except where otherwise stated.

The occurrence

The information contained in this Interim Report is derived from the ongoing investigation of the occurrence. Readers are cautioned that there is the possibility that new evidence may become available that alters the circumstances as depicted in the report.

On 24 October 2013, at about 0940 Eastern Daylight-saving Time,² the pilot of a PZL Mielec M18A Dromader, registered VH-TZJ (TZJ) (Figure 1) took off from Nowra Airport, New South Wales to conduct a firebombing mission in the Budawang National Park about 37 km west of Ulladulla, New South Wales. Another firebombing aircraft with one pilot and a support helicopter with two crew and one observer were also involved in the mission. The other firebombing pilot described the weather at the time as 'okay' with moderate wind and little turbulence.

Figure 1: VH-TZJ on 22 October 2013



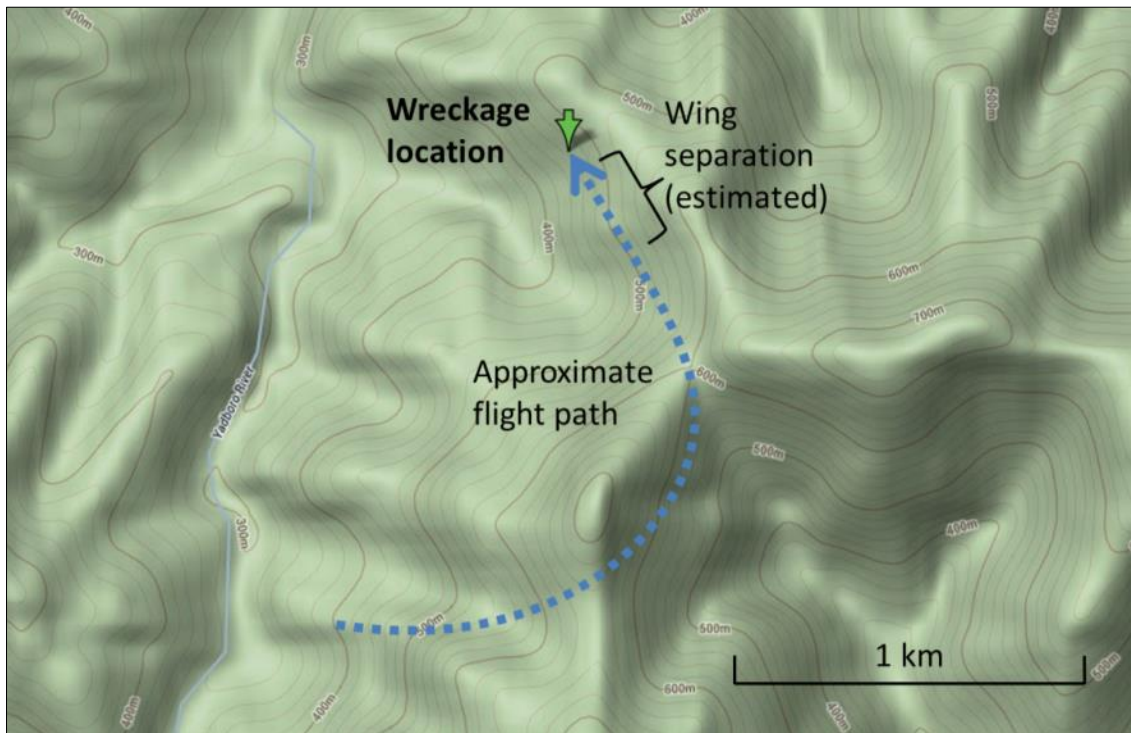
Source: Witness. Used with permission

At about 1000 the crew of the support helicopter identified a firebombing target near the north end of a ridgeline, and marked its location to the pilots of the firebombing aircraft by hovering over the target. The pilot of TZJ acknowledged the target location and advised the intended flight path. The crew of the helicopter then stationed nearby to observe the drop while staying away from the other aircraft's anticipated flight path.

The helicopter crew later reported that TZJ made a broad, descending left turn onto an approximate north-north-westerly heading, flying along the ridgeline at about 100 ft above the trees and directly towards the target (Figure 2). At about the same time as or immediately after the aircraft's wings were rolled level, the left wing separated. The aircraft immediately rolled left and descended, impacting terrain. The accident occurred at about 1004. The aircraft was destroyed by impact forces and some parts of the wreckage were additionally damaged by small post-impact fires (Figure 3). The pilot was fatally injured.

² Eastern Daylight-saving Time was Coordinated Universal Time (UTC) + 11 hours.

Figure 2: Approximate aircraft flight path



Source: Google Maps. Image modified by ATSB

Figure 3: Main wreckage



Source: ATSB

Context

Pilot information

The pilot held an Air Transport Pilot (Aeroplane) Licence, issued in 2003. The pilot's logbook recorded a total of 9,501.6 hours, including 228.0 hours firebombing and 8,223.8 hours agricultural flying.

Records showed that the pilot was appropriately endorsed to fly the Honeywell TPE331 turbine-engined M18, with relevant experience including 169.3 hours on that version and 65.4 hours on the piston version. The pilot held a valid Class 1 Medical Certificate and was the aircraft operator's chief pilot.

The pilot flew TZJ from Trangie, New South Wales, to Nowra on 21 October 2013, before flying nine firebombing missions in the aircraft from Nowra over 21–22 October. Because of poor weather on 23 October, the pilot conducted only one operational flight that day.

On the morning of 24 October, the pilot took off in TZJ on a short flight to dump water that had been stored in the aircraft's hopper overnight, before returning to Nowra to take on a load of fire retardant. The accident flight was the aircraft's and pilot's first operational flight that day.

Aircraft information

General information

The aircraft, serial number IZ013-32, was a single-engine agricultural and firebombing aircraft manufactured in Poland in 1984. Following operation in the United States (US) it was first registered in Australia in 2004. Maintenance records showed that the aircraft had accumulated 8,815.4 adjusted³ airframe hours prior to the accident flight. It was originally fitted with a radial engine and in 2004 it was fitted with a Honeywell TPE331-11U-612G turbine engine and Hartzell HC-B5MP-5BL five-bladed constant-speed propeller. It was fitted with an enlarged, 3,000 L hopper.

Under the Australian supplemental type certificate (STC) SVA521,⁴ the aircraft was permitted to operate at take-off weights up to 6,600 kg. Flight logs indicated that it was loaded to 6,100 kg take-off weight for each of the firebombing missions in the days preceding the accident. Fuel records showed that the aircraft was fully fuelled at the end of the previous day.

At the time of the accident, the aircraft was one of 30 M18 aircraft on the Australian register.

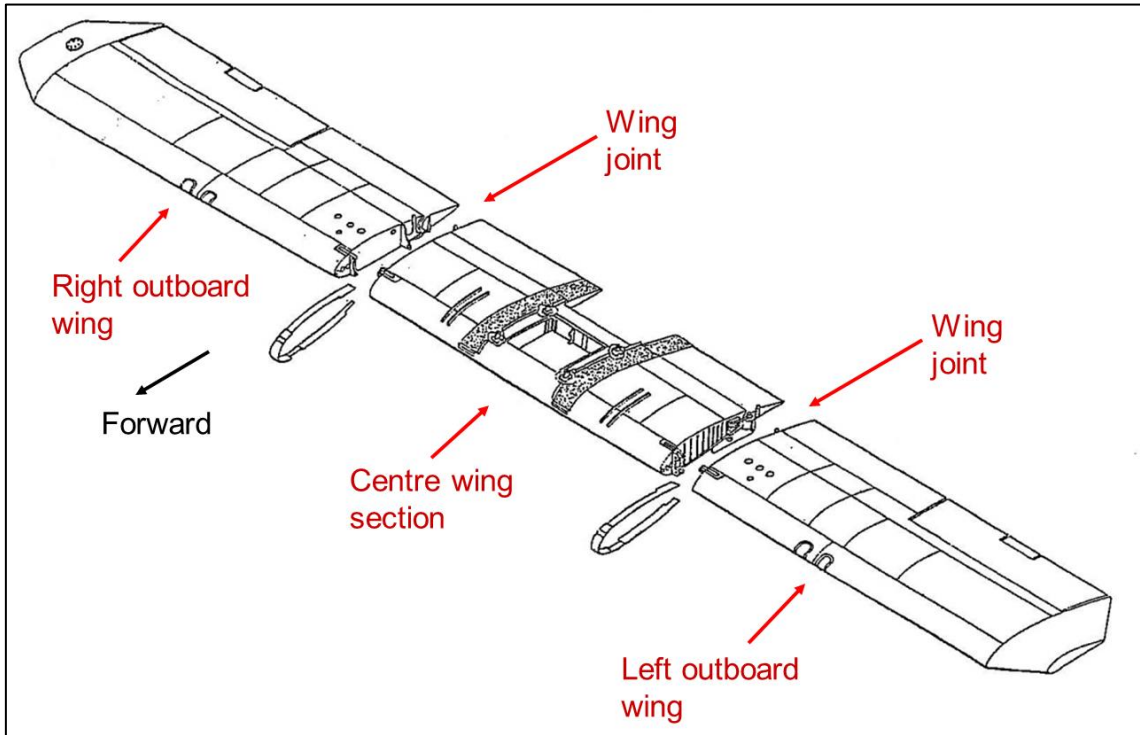
Wing structure

M18 aircraft have a cantilever wing; that is, it is anchored at one end with no mid-span supports. The wing consists of three sections: the central wing section, and the left and right outboard wing sections (Figure 4). Between each outboard wing section and the centre section there are three attachment points (Figure 5). At each of the main spar attachment points, a single lug on the outboard wing is secured between two lugs on the centre wing by a through bolt, expansion mandrel and bush (Figure 5).

³ The aircraft's service life was adjusted by a factor dependent on the take-off weight, up to a factor of 2.5 at 6,600 kg. As noted in the section *Operation of the M18 Dromader at take-off weights above 4,200 kg*, the maintenance records did not consider operations at higher weights prior to 2009. As such, the adjusted airframe hours should have been higher than 8,815.4 hours.

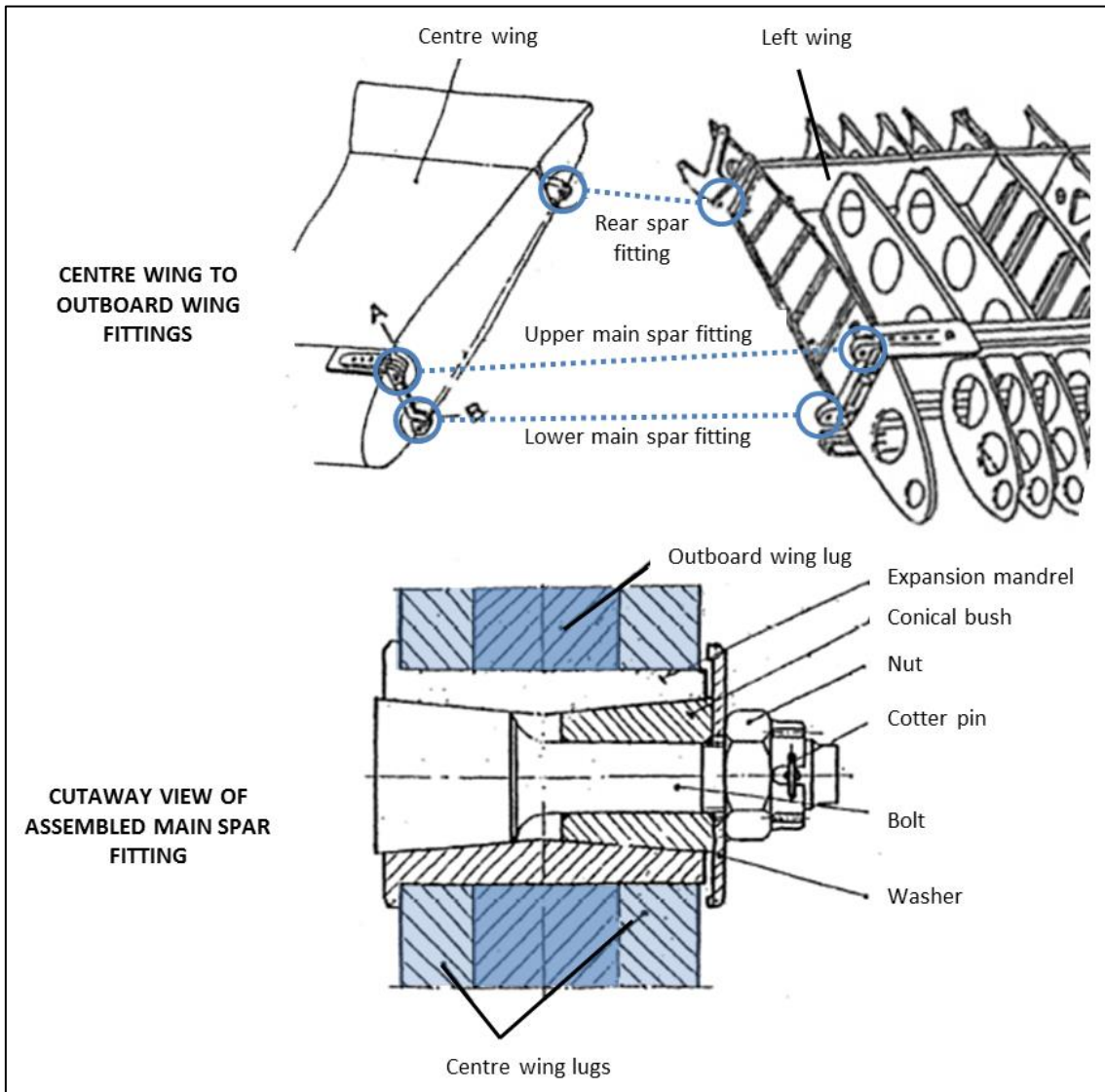
⁴ See the section titled *Operation of the M18 at take-off weights above 4,200 kg*.

Figure 4: Overview of wing structure



Source: PZL. Image modified by ATSB.

Figure 5: Centre wing to left wing attach fittings



Source: PZL. Images modified by ATSB.

Wing attach fitting maintenance requirements

In 2000, investigations by the US National Transportation Safety Board into a number of US M18 accidents in which the wings separated in-flight discovered severe corrosion and cracking in the wing lower attach fittings, which led to fatigue cracking and failure of the fitting.⁵

On 3 August 2000, the aircraft manufacturer issued service bulletin (SB) E/02.170/2000, which provided procedures for dealing with corrosion of the centre wing-to-outboard wing attach fittings. The SB included a procedure for inspection of fittings found to be affected by corrosion and stated that:

- ‘the only acceptable inspection method is magnetic cracks detection⁶ (original emphasis)
- ‘the critical area of the joints include the lower surfaces of the [main holes] in the wing lower attach joints’

⁵ National Transportation Safety Board investigations FTW00LA149, FTW99LA170, and FTW00LA267.

⁶ ‘Magnetic cracks detection’ probably refers to magnetic particle inspection, a form of non-destructive test (NDT). Using this method, the application of a magnetic field to the area of inspection draws a ferromagnetic liquid into any cracks, making them more visible.

- the inspections did not require outboard wing removal
- any cracked fittings and worn-out expansion mandrels were subject to mandatory replacement.

On 11 September 2000, the Civil Aviation Safety Authority (CASA) approved a procedure for inspection of the fittings using eddy-current testing as an alternative to the magnetic particle inspection required by the SB. This procedure provided information on preparing the area for inspection, instrument calibration, and other matters specific to the eddy-current testing method. It did not require wing removal and did not specify any particular critical area for inspection. Being a replacement for the inspection part of the SB, it did not provide repair instructions.

On 19 October 2000, CASA issued airworthiness directive (AD) AD/PZL/5. It specified that the centre wing-to-outboard wing attach joints were to be inspected, using magnetic particle methods, for cracks in the lugs, corrosion in the main holes, and ovalisation of the main holes. The inspection was to be carried out in accordance with the manufacturer's SB and was mandatory for all M18s after the fittings accumulated 2,500 hours service. Further inspections were required every 500 airframe hours or every 12 months, whichever came first.⁷

Aircraft maintenance information

Maintenance records indicated that the main spar attach point fittings on TZJ were installed new in 2004. The aircraft records indicated that since then it had accrued 3,980 flight hours, and 5,784 adjusted hours.⁸ A valid maintenance release was found in the wreckage.

The main spar attach fittings were last inspected on 8 August 2013, using an eddy-current procedure. Records indicated that since then, the aircraft had accumulated 120.1 flight hours and 154.7 adjusted hours, not including the accident flight.

Wreckage and site information

The on-site examination found that the left wing had separated at the attachment joint between the outboard wing and centre wing sections, about 6 m from the wingtip (Figure 6). Preliminary examination of the attach fittings indicated that the left outboard wing lower attachment lug had fractured through an area of pre-existing fatigue cracking in the lug lower ligament (Figure 7 and Figure 8). The fatigue cracking reduced the structural integrity of the fitting to the point where operational loads produced an overstress fracture of the remaining lug material. The detached section of lug was retained by the centre wing lugs and showed a matching fracture surface (Figure 8).

A number of aircraft components were removed from the accident site for further examination at the ATSB's Canberra facilities, including:

- both sections of the separated lower main spar lug and the remainder of the lower main spar attach fitting (left wing)
- the entire upper main spar attach fitting (left wing)
- part of the rear spar attach fitting (left wing)
- the entire lower main spar attach fitting (right wing).

⁷ Some aircraft were permitted to have the upper main spar fittings inspected every 800 hours or 12 months.

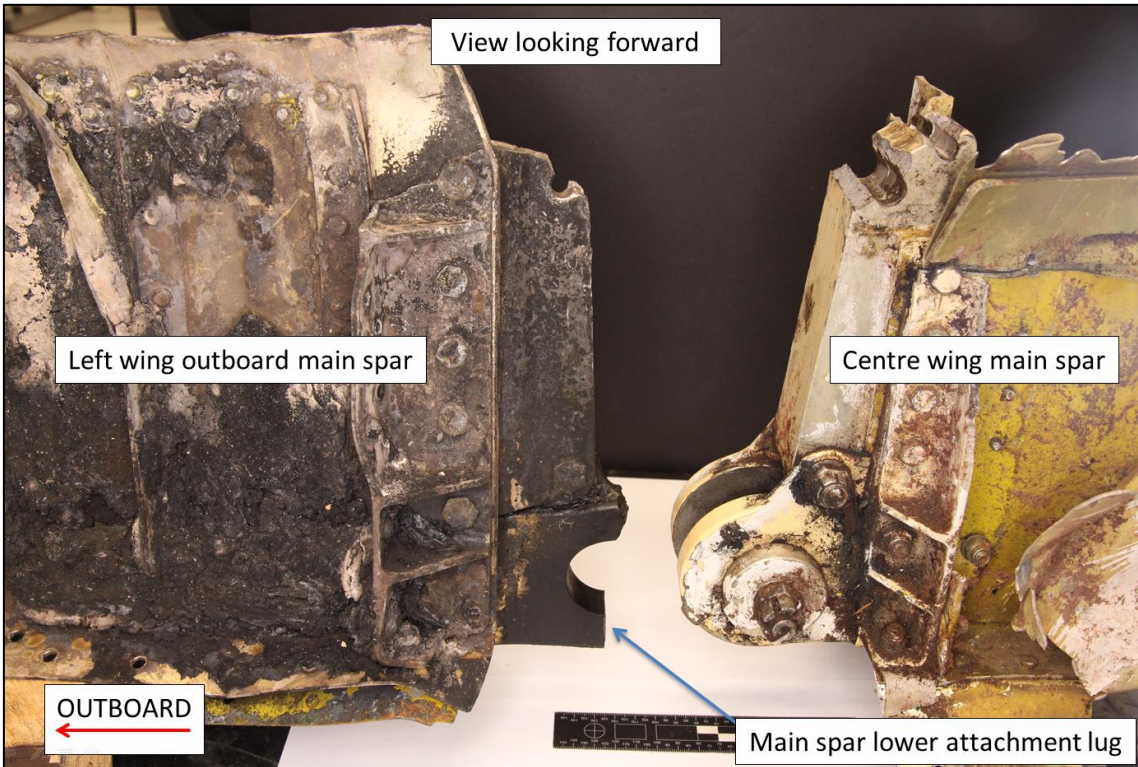
⁸ As noted in the section *Operation of the M18 Dromader at take-off weights above 4,200 kg*, the maintenance records did not consider operations at higher weights prior to 2009. As such, the adjusted hours for the main spar attach point fittings should have been higher than 5,784 hours.

Figure 6: Outboard left wing (underside of wing visible, lower attach fitting arrowed)



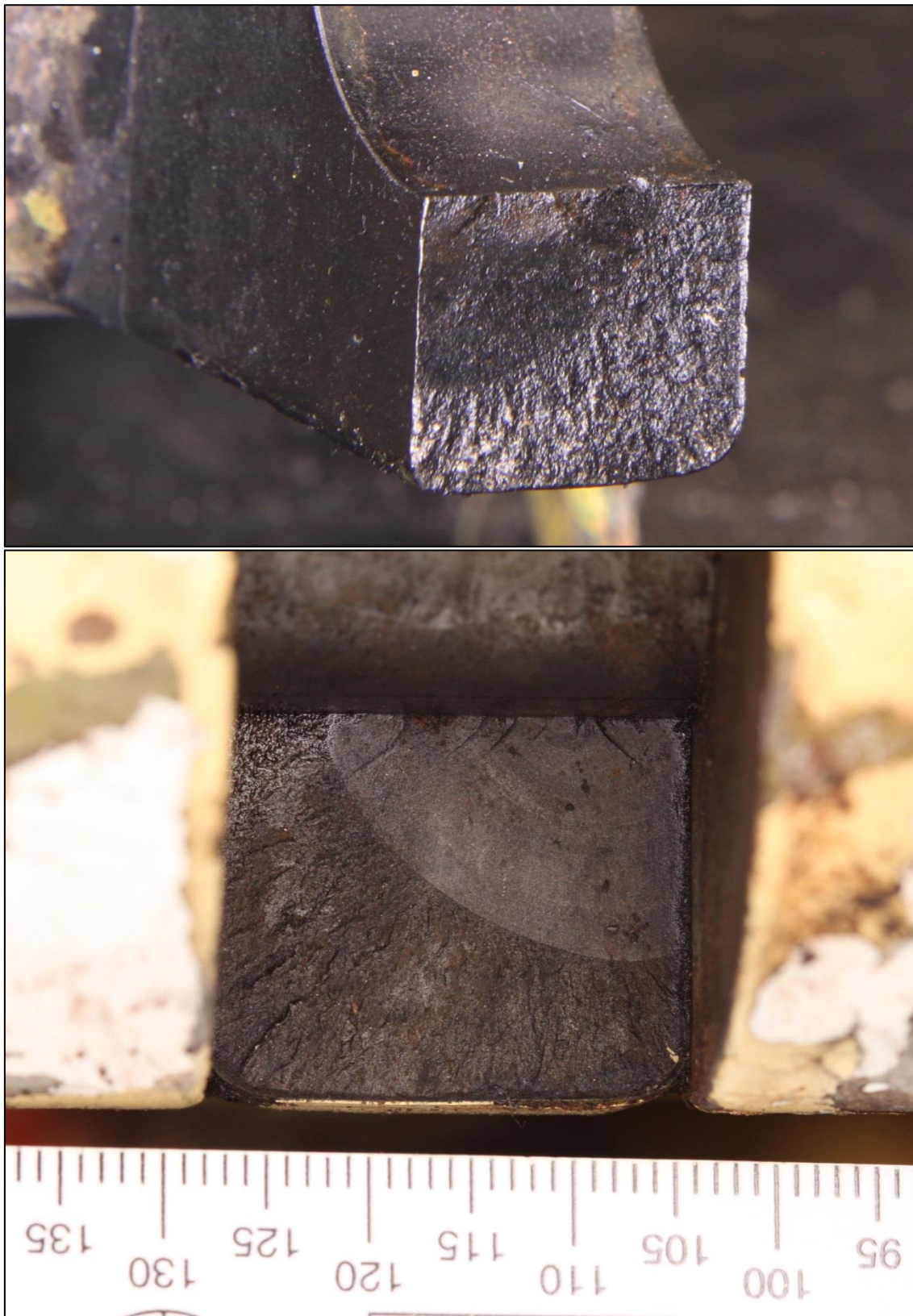
Source: ATSB

Figure 7: Lower main spar attach fitting



Source: ATSB

Figure 8: Mating fracture surfaces of left lower main spar attachment lug. Main (outboard) part above, detached (inboard) part below.



Source: ATSB

Previous ATSB investigations

Since 2006, the ATSB has investigated three other fatal accidents involving M18s, including one in-flight breakup (investigation AO-2008-084).⁹ That in-flight breakup involved a separation of the outboard 1.8 m of the right wing, and the failure mechanism did not involve fatigue cracking. The other two accidents involved an in-flight loss of control (investigations 200600851 and AO-2011-082).¹⁰

In April 2013, the ATSB published a safety issues investigation report into operations of the M18 Dromader at take-off weights above 4,200 kg.¹¹

All of these investigation reports are available on the ATSB website at www.atsb.gov.au.

Operation of the M18 at take-off weights above 4,200 kg

Aircraft service life

The M18 has a nominal airframe service life of 5,000 hours, which can be extended to 6,000 and 10,000 hours with the application of service bulletins¹² from the aircraft manufacturer. Those service bulletins require modifications and additional inspections to obtain the life extensions.

Weight increase permitted by exemptions

From 2002 to 2011, several CASA exemptions had effect in relation to the operation of restricted or agricultural category aircraft at weights in excess of the maximum take-off weight (MTOW) stated in the relevant aircraft flight manual (AFM). In general, they exempted pilots from complying with different parts of the Australian Civil Aviation Regulations or Civil Aviation Safety Regulations, either directly or indirectly pertaining to the requirement to adhere to take-off weight limitations. This was predicated on the complying aircraft having a jettison system installed that allowed pilots to reduce aircraft weight by dumping the hopper load if and when necessary.

In November 2011, as part of investigation AO-2008-084, the ATSB advised CASA of the potential for a different interpretation of the exemptions than that intended by CASA. It was identified that, in certain circumstances, this could result in an aircraft being flown outside the relevant weight-dependent limits, such as airspeed limits. In February 2012, CASA revoked those exemptions and introduced exemption EX01/12, which clarified the requirements for operations in excess of the MTOW stated in the AFM.

Aircraft modifications

M18 aircraft were originally fitted with a nine-cylinder radial piston engine and 2,500 L hopper, with a maximum hopper load weight of 1,500 kg. However, US Federal Aviation Administration STC SA09039SC allowed the M18 to be fitted with a Honeywell TPE331 turboprop engine. This STC was available to Australian operators of the M18.

An M18 aircraft with a TPE331 engine could be further modified under an engineering order to enlarge the hopper to a capacity of 3,000 L.¹³ On its own, the engineering order did not change

⁹ ATSB investigation AO-2008-084: *In-flight breakup - 58 km south-west of Nyngan, New South Wales, 29 December 2008, VH-IGT, PZL M18A Dromader*

¹⁰ ATSB investigations 200600851: *Aircraft loss of control -20 km SSW of Cootamundra, NSW - 16 February 2006 VH-FVF, PZL M-18A Dromader* and AO-2011-082: *Collision with terrain - PZL-Mielec M18A Turbine Dromader, VH-FOZ, 23 km WSW of Dirranbandi, Qld, 19 July 2011*

¹¹ ATSB investigation AI-2011-150: *Operation of the PZL-Mielec M18 Turbine Dromader at take-off weights above 4,200 kg.*

¹² An advisory notice issued by a manufacturer to alert operators of service issues and/or modifications for the particular aircraft type.

¹³ It was reported that the hopper could not be completely filled in practice. The actual useable capacity varied between aircraft. As an indication, it was reported that a typical maximum load was about 2,600 L.

the maximum weight that could be carried, but it offered the benefit of being able to carry more low-density material (such as granules) in the enlarged hopper.

Operations at increased weights

The M18 aircraft's normal category MTOW is 4,200 kg. Three optional AFM supplements (namely, PZL supplements No. 1, 16, and 17) were available from the aircraft manufacturer in support of operations at increased weights up to 4,700 kg (No. 1) and 5,300 kg (No. 16 and 17).¹⁴ Supplements No. 16 and 17 required the aircraft's service life to be adjusted by a factor of 1.35; that is, flights at take-off weights between 4,700 kg and 5,300 kg required the actual flight hours to be multiplied by 1.35 for the purposes of recording the airframe life. Factoring was not required for operations at take-off weights below 4,700 kg.

The M18 aircraft repair manual stated that the 'increase in T-O [take-off] weight up to 11,700 lbs (5,300 kg) causes higher fatigue wear and [a] drop of service life by 1.35 times.' The aircraft manufacturer advised that the airframe life factor is only valid for the radial engine version.¹⁵

Separately, the US STC SA01276AT permitted some M18s to operate at take-off weights up to 5,300 kg. It required the aircraft's service life to be adjusted by a factor of 1.35 for operations above 4,700 kg.

Australian STC SVA521, issued 6 March 2009, permitted some M18 and M18A aircraft fitted with the TPE331 engine and enlarged hopper to operate at weights up to 6,600 kg. PZL supplements No. 1 and 16 were not required to be incorporated in an aircraft's AFM as a prerequisite for operations under STC SVA521. This STC required the aircraft's service life to be adjusted by a factor of up to 2.5 depending on take-off weight.

In November 2008, while flight tests and approval for STC SVA521 were pending, CASA issued an exemption specifically applying to eight Australian-registered M18s, including TZJ. It permitted operations up to 6,600 kg as 'an interim measure to allow the aircraft to be used for firefighting and agricultural operations during the fire season' and ceased having effect on 1 April 2009. The exemption stated that:

For the purpose of calculating the service life, the recorded flight hours must be adjusted using the factors specified in section 2.12 Service Limitation of the Flight Manual Supplement. The calculations must take into account overweight operations of the aircraft prior to the issue of this instrument.

Operations at higher weights prior to 2009

The ATSB obtained a letter written by an M18 operator, dated 19 September 2008, which was part of the document package compiled for certification of STC SVA521. It stated that three operators had flown nine M18 aircraft, including TZJ,¹⁶ 'at all-up weights of 6,400 kg to 6,633 kg for more than 90% of the time' in the period 1999–2008.

Two fatal accidents involving M18s were investigated by the ATSB in 2006 and 2008, and both aircraft were found to have been flown at weights above 4,700 kg without the application of service life factoring to those flights (investigations 200600851 and AO-2008-084). Other sources reported that several M18s, including some not listed in the M18 operator's letter and flown by other operators, were regularly flown above 5,300 kg prior to 2009.

¹⁴ PZL supplement 1 was available for all M18 variants. PZL supplement 16 was only available for the M18, M18A, and M18AS, and only for fire-fighting operations. PZL supplement 17 was only available for the M18B.

¹⁵ If an aircraft is modified, the fatigue considerations may change. Federal Aviation Administration Advisory Circular AC23-13A stated that 'changes to the operational characteristics that may be important for fatigue include higher design airspeeds or higher average speed. They also include changes to the maximum allowable weight and centre of gravity envelope, changes to the average weight and centre of gravity location, and engine or propeller changes.'

¹⁶ Incorrectly stated as VH-PZJ in the letter.

Previous safety action

The ATSB investigation AO-2008-084 identified the following safety issue:

A number of operators of the PZL M18 Dromader aircraft had not applied the appropriate service life factors to the aircraft's time in service for operations conducted with take-off weights greater than 4,700 kg, as required by the aircraft's service documentation. Hence the operators could not be assured that their aircraft were within their safe service life.

In response, in 2011 CASA directed some operators to ensure that service life factors had been correctly applied. In July 2013, it directed the operator of TZJ to recalculate airframe hours for its four M18 aircraft, dating from when STC SVA521 was incorporated in 2009.

Service life of VH-TZJ

Maintenance records for TZJ show that, while the service life factor was retrospectively applied from 2009–2013, no service life factoring was applied for any operations at weights above 4,700 kg for the period 2004–2009. The ATSB estimated that, had the aircraft actually been flown at higher weights over that period and the service life factoring been applied, TZJ would have accrued about 10,400–11,000 adjusted hours. However, the centre wing to outboard wing fittings, including the one that failed on 24 October 2013, were replaced in 2004. The ATSB estimated that those fittings would themselves have accrued about 7,400–8,000 adjusted hours at the time of the accident.

Service life of other M18s

As of 16 December 2013, there were 29 M18s registered in Australia. Of those, six were listed on the aircraft register as being turbine-powered. However, the ATSB has determined that at least four other M18s in Australia are turbine-powered, three of which have the TPE331 engine.

Based on a CASA review, other M18s in Australia have accrued between 3,100 and 9,200 hours. It is unknown whether service life factoring has been correctly applied over the life of those aircraft; however, it is possible that some or all have been flown at weights above 4,700 kg without the associated factoring having been correctly applied.

Safety analysis

The circumstances associated with the accident involving VH-TZJ on 24 October 2013 are still being investigated. This analysis focuses only on the recorded aircraft hours for M18 aircraft operating at higher weights.

A number of aircraft manufacturer supplements, Australian exemptions and national and overseas supplemental type certificates have allowed for operation of the PZL Mielec M18 Dromader aircraft at gross weights above the maximum stipulated by the aircraft manufacturer. A number of strategies to reduce accompanying risk have been used, including the progressive adjustment (or factoring) of actual flight hours to determine airframe life.

The evidence to date shows that, in a number of cases, the application of adjustments to M18 aircraft flight hours in Australia has been inconsistent and/or unreliable. In particular, it would appear that in the period prior to 2009, such factors may not have been applied at all. In consequence, operators of such aircraft may not have assured themselves that their aircraft's recorded flight hours truly reflect their aircraft's airframe life. This raises the possibility that these aircraft might be close to or have exceeded their prescribed maintenance schedules or airframe life, increasing the risk of in-flight failure of aircraft structure(s), components and/or controls.

The issue applies to turbine- or piston-engined Australian M18 aircraft approaching any of the 5,000, 6,000 or 10,000-hour service life limits, and which were flown at weights above 4,700 kg prior to 2009 without the appropriate service life factoring having been applied.

The centre wing to outboard wing fittings on VH-TZJ, including the one that failed on 24 October 2013, were installed new in 2004. The ATSB estimated that, even if appropriate factoring had been applied, these fittings would not have exceeded the 10,000-hour limit at the time of the accident. However, it is likely that the aircraft would have accrued more than the permitted limit of 10,000 hours by the time of the accident and the airframe would have been required to be removed from service.

Finding

From the evidence available to date, the following finding is made with respect to the in-flight breakup involving PZL Mielec M18A Dromader aircraft, registered VH-TZJ, which occurred 37 km west of Ulladulla, New South Wales on 24 October 2013. It should not be read as apportioning blame or liability to any particular organisation or individual.

Safety issues, or system problems, are highlighted in bold to emphasise their importance.

A safety issue is an event or condition that increases safety risk and (a) can reasonably be regarded as having the potential to adversely affect the safety of future operations, and (b) is a characteristic of an organisation or a system, rather than a characteristic of a specific individual, or characteristic of an operating environment at a specific point in time.

Other factors that increased risk

- **Operators of some Australian M18 Dromaders, particularly those fitted with turbine engines and enlarged hoppers and those operating under Australian supplemental type certificate (STC) SVA521, have probably conducted flights at weights for which airframe life factoring was required but not applied. The result is that some of these aircraft could be close to or have exceeded their prescribed airframe life, increasing the risk of an in-flight failure of the aircraft's structure. [Safety issue]**

Safety issues and actions

The safety issues identified to date during this investigation are listed in the Findings and Safety issues and actions sections of this report. The Australian Transport Safety Bureau (ATSB) expects that all safety issues identified by the investigation should be addressed by the relevant organisation(s). In addressing those issues, the ATSB prefers to encourage relevant organisation(s) to proactively initiate safety action, rather than to issue formal safety recommendations or safety advisory notices.

Depending on the level of risk of the safety issue, the extent of corrective action taken by the relevant organisation, or the desirability of directing a broad safety message to the [aviation, marine, rail - as applicable] industry, the ATSB may issue safety recommendations or safety advisory notices as part of the final report.

Initial safety action regarding wing fitting inspections

Although no organisational or systemic safety issues were identified at the time, the Civil Aviation Safety Authority advised of the following action in October/November 2013 in response to this accident.

On 25 October 2013, the Civil Aviation Safety Authority (CASA) issued directions to the registered operators of eight M18 (Dromader) aircraft, stating that the aircraft must not be flown until further notice. On the same day, CASA sent a letter to all M18 operators with information on:

... some issues that operators of these aircraft need to understand so that the aircraft is operated and maintained within the prescribed limitations for the approved configurations. These issues relate to the service life calculation and centre of gravity movement during flight.

On 1 November 2013, CASA issued directions to all registered operators of the 29 M18 aircraft in Australia that the aircraft must not be flown until further notice. In addition, it directed that operators of M18 aircraft provide information relating to the fulfilment of airworthiness directive (AD) AD/PZL/5 (including maintenance certification and non-destructive test reports), as well as information about each aircraft's operating weights.

On 15 November 2013, CASA issued an amendment to AD/PZL/5, revoking the approval for the eddy-current procedure for conducting the wing joint inspections. It also added a 100-hourly visual inspection, and additional wing-off inspections every 2,500 hours. CASA also issued a direction to the registered operators of M18 aircraft in Australia that the aircraft could be flown once the amended AD was complied with.

On 22 November 2013, CASA issued AD/PZL/5 Amendment 2, to additionally require magnetic particle inspections to be conducted on aircraft with less than 2,500 hours' time in service, allow the use of CASA-approved alternative magnetic particle inspection methods, reduce complexity of the AD, and make corrections to reference documents.

M18 Dromader airframe life factoring

Number:	AO-2013-187-SI-01
Issue owner:	Civil Aviation Safety Authority
Operation affected:	Aviation: General aviation

Safety issue description:

Operators of some Australian M18 Dromaders, particularly those fitted with turbine engines and enlarged hoppers and those operating under Australian supplemental type certificate (STC) SVA521, have probably conducted flights at weights for which airframe life factoring was required

but not applied. The result is that some of these aircraft could be close to or have exceeded their prescribed airframe life, increasing the risk of an in-flight failure of the aircraft's structure.

Response to safety issue and/or Proactive safety action taken by: Civil Aviation Safety Authority

The ATSB will publish any safety action taken by the Civil Aviation Safety Authority in response to this safety issue. In the interim, the ATSB issues the following safety advisory notice to all M18 operators.

ATSB safety advisory notice to: M18 operators

Action number: AO-2013-187-SAN-005

The Australian Transport Safety Bureau cautions M18 operators of the risks associated with not reliably applying service life factoring to any overweight operations in this aircraft type. It is suggested that operators review the extent to which their aircraft may have been operated above 4,700 kg, and whether the correct service life factoring has been applied to such operations throughout its full operational life.

Continuing investigation

The investigation is continuing and will include examination of the:

- wing attachment point inspection procedures, and methods used in practice
- approval mechanisms for the alternate method of compliance
- history of the aircraft's operations and maintenance.

It is anticipated that the final investigation report will be released to the public no later than October 2014.

Should any other significant safety issues emerge in the course of the investigation, the ATSB will immediately bring those issues to the relevant authorities or organisations and publish them as required.

General details

Occurrence details

Date and time:	24 October 2013 – 1000 EST	
Occurrence category:	Accident	
Primary occurrence type:	In-flight breakup	
Location:	37 km west of Ulladulla, New South Wales	
	Latitude: 35° 20.62' S	Longitude: 150° 04.78' E

Aircraft details

Manufacturer and model:	PZL Mielec	
Registration:	VH-TZJ	
Serial number:	IZ013-32	
Type of operation:	Aerial work	
Persons on board:	Crew – 1	Passengers – 0
Injuries:	Crew – 1 (fatal)	Passengers – 0
Damage:	Destroyed	

Australian Transport Safety Bureau

The Australian Transport Safety Bureau (ATSB) is an independent Commonwealth Government statutory agency. The ATSB is governed by a Commission and is entirely separate from transport regulators, policy makers and service providers. The ATSB's function is to improve safety and public confidence in the aviation, marine and rail modes of transport through excellence in: independent investigation of transport accidents and other safety occurrences; safety data recording, analysis and research; fostering safety awareness, knowledge and action.

The ATSB is responsible for investigating accidents and other transport safety matters involving civil aviation, marine and rail operations in Australia that fall within Commonwealth jurisdiction, as well as participating in overseas investigations involving Australian registered aircraft and ships. A primary concern is the safety of commercial transport, with particular regard to fare-paying passenger operations.

The ATSB performs its functions in accordance with the provisions of the *Transport Safety Investigation Act 2003* and Regulations and, where applicable, relevant international agreements.

Purpose of safety investigations

The object of a safety investigation is to identify and reduce safety-related risk. ATSB investigations determine and communicate the factors related to the transport safety matter being investigated.

It is not a function of the ATSB to apportion blame or determine liability. At the same time, an investigation report must include factual material of sufficient weight to support the analysis and findings. At all times the ATSB endeavours to balance the use of material that could imply adverse comment with the need to properly explain what happened, and why, in a fair and unbiased manner.

Developing safety action

Central to the ATSB's investigation of transport safety matters is the early identification of safety issues in the transport environment. The ATSB prefers to encourage the relevant organisation(s) to initiate proactive safety action that addresses safety issues. Nevertheless, the ATSB may use its power to make a formal safety recommendation either during or at the end of an investigation, depending on the level of risk associated with a safety issue and the extent of corrective action undertaken by the relevant organisation.

When safety recommendations are issued, they focus on clearly describing the safety issue of concern, rather than providing instructions or opinions on a preferred method of corrective action. As with equivalent overseas organisations, the ATSB has no power to enforce the implementation of its recommendations. It is a matter for the body to which an ATSB recommendation is directed to assess the costs and benefits of any particular means of addressing a safety issue.

When the ATSB issues a safety recommendation to a person, organisation or agency, they must provide a written response within 90 days. That response must indicate whether they accept the recommendation, any reasons for not accepting part or all of the recommendation, and details of any proposed safety action to give effect to the recommendation.

The ATSB can also issue safety advisory notices suggesting that an organisation or an industry sector consider a safety issue and take action where it believes it appropriate. There is no requirement for a formal response to an advisory notice, although the ATSB will publish any response it receives.