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# AIRWORTHINESS DIRECTIVE

THE GLIDING FEDERATION OF AUSTRALIA Inc.

## GFA AD 687 Issue 2

Date: October 15<sup>th</sup>, 2019

### SUBJECT

### ENGINE FIRE CONTAINMENT AND RETARDATION

#### BACKGROUND

Over the past 3 decades there have been numerous powered sailplane engine fires both in flight and on the ground. In addition, many instances have been found of potential fire hazards in the form of fuel leaks, oil leaks and deficient exhaust systems. Instances of fires starting, then self-extinguishing have been found. Adding to the mix are some powered sailplane types that may not have fully met the fire protection standards set by OSTIV, LSFM, JAR, and CS when originally certified.

In recent years in Australia, 3 gliders with engines have had serious fires out of a population of 322. With 1% of the engined glider fleet affected, this places the probability of having a serious fire at 1 per 120,000 flying hours. By comparison the average fatality rate in Australian gliding is 1 per 50,000 flying hours. The three serious fires were probably due to maintenance faults. However, improved fire proofing may have given them a more time to descend from altitude and evacuate the aircraft.

The purpose of this Airworthiness Directive is to provide operators and inspectors with inspection guidelines and procedures to meet a minimum standard for fire containment and retardation when either re-applying the original fire retarding paint used by the powered sailplane manufacturer, a manufacturer's or current type certificate holders approved alternative, or an alternative **Intumescent Fire Retarding Paint approved by GFA**. The aim is to provide enough time for the flight crew to take remedial action. Epoxy fibreglass burns and spreads aggressively. It can have no strength left in 20 seconds. The Intumescent Paint slows this dramatically and it may last 15 minutes.

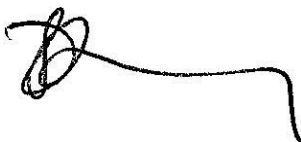
The requirement to complete an inspection report is intended to make the owner consider "Is my aircraft safe, or can I make it safer?" It is noted that in some of the inspection reports returned with Issue 1, some people misunderstood the risks and they should reconsider. For example: if a broken connection leaks fuel or oil into the pop up engine bay, it will erupt flames out of the bay doors if ignited regardless of whether the engine is in or out or the doors are closed or open.

#### REVISION

This issue replaces Issue 1 dated 15 Mar 2019. Issue 1 had GFA Engineering Order MB18-12-1 attached to it. This caused significant confusion as the wording in the Engineering Order used the word "mandatory". Issue 2 has removed GFA Engineering Order MB18-12-1, which is now attached to AN 175 Issue 3. AN 175 Issue 3 and the attached Engineering Order **are advisory despite the use of the word**

	<b>mandatory</b> , but are highly recommended and should be considered.
<b>TYPES / MODELS AFFECTED</b>	All self-launching and power assisted sailplanes. This includes Experimental category. Not applicable to Light Sports Aircraft or electric drive.
<b>CURRENT FIRE PROTECTION</b>	<p>Production powered sailplanes have mostly been delivered originally with fire retarding paint on the inside of front engine cowls, the inside of rear fuselage engine compartments and some external airframe surfaces. Over time those coatings are known to flake off exposing the flammable surface underneath, and in the event of fire, allow fire to potentially take hold in the structure. Overcoating with paint of unknown properties has occurred, and some types may not have had fire retarding paint applied at all. Some types may not have fully Fireproof firewalls.</p> <p>If the firewall is not well sealed smoke can enter the cockpit. In all three fires the pilots have suffered extreme smoke inhalation issues. If the firewall is missing or incomplete, air will blast the fire through the structure making it much more severe.</p>
<b>REFERENCE DOCUMENTS</b>	<ol style="list-style-type: none"> <li>1. GFA Engineering Order MB18-12-1 (as amended)</li> <li>2. GFA Airworthiness Advice Notice AN175 (as amended)</li> </ol>
<b>INSPECTION PROGRAM</b>	<p>The following inspection program will allow the registered operator to determine what level of action needs to be taken to improve fire containment.</p> <p>(1) <b>BEFORE JUNE 30th, 2019</b>, or in conjunction with the next annual inspection which ever sooner. These inspections and actions are to be completed by a GFA authorised Annual Inspector, any type.</p> <ol style="list-style-type: none"> <li>A. Cockpit Placards listing actions required in the event of engine fire are to be prepared with reference to the Aircrafts Flight Manual, Pilots Operating Handbook, or equivalent and fitted to the aircraft's cockpit. Refer to AN 175 for an example.</li> <li>B. Inspect for the condition of the paint on the inside of front engine cowls, rear fuselage engine compartments and adjacent external airframe areas.</li> <li>C. Determine the configuration of the firewall, or firewalls using the definitions in Annex A.</li> <li>D. Complete the Inspection Schedule attached to this AD and email to the GFA CTO in PDF format.</li> <li>E. If deficiencies are found with the retardant paint applied to the engine cowlings, eg bare patches or peeling, enter in the powered sailplane Maintenance Release Part 1: "Retardant paint rectifications to the engine cowlings to be completed by next Annual Inspection."</li> <li>F. If deficiencies are found with the retardant paint (if applied to the firewall eg bare patches or peeling, enter in the powered sailplane Maintenance Release Part 1: "Retardant paint rectifications to the firewall to be completed by next engine overhaul.</li> </ol>

	<p><b>(2) NEXT ANNUAL INSPECTION</b></p> <p>These inspections and actions are to be completed by a GFA authorised, Annual Inspector, powered sailplanes, rating.</p> <p>A. Rectify all of the fire retarding paint deficiencies found with the engine cowlings and listed on the returned Inspection Schedule, in accordance with the procedures outlined in GFA Engineering Order MB18-12-1 (current issue).</p> <p><b>(3) AT OR BEFORE NEXT ENGINE OVERHAUL</b></p> <p>These inspections and actions are to be completed by a GFA authorised, Annual Inspector, powered sailplanes, rating.</p> <p>A. Rectify all of the fire retarding paint deficiencies found with the engine firewall and listed on the returned Inspection Schedule.</p> <p><b>(4) AT EVERY SUBSEQUENT ANNUAL INSPECTION</b></p> <p>These inspections and actions are to be completed by a GFA authorised, Annual Inspector, powered sailplanes, rating.</p> <p>A. Inspect the condition of the paint on the inside of front engine cowl, rear engine compartments, and adjacent external airframe areas. Any damaged or peeling material must be repaired or replaced as outlined in GFA Engineering Order MB18-12-1 (current issue).</p> <p>B. Verify that no flammable material has been attached to the cockpit side of metal firewalls.</p> <p>C. Confirm that cockpit placards are in place.</p>
<b>IMPORTATIONS</b>	<p>All self-launching and power assisted sailplanes, new and second hand, imported after June 30th 2019 must be shown to be compliant with this Airworthiness Directive before the issue of an Australian Certificate of Airworthiness.</p>
<b>MANDATORY</b>	<p>The following requirements are <b>MANDATORY</b>:</p> <ol style="list-style-type: none"> <li>1. No bare patches or peeling is allowed in the fire retarding paint cover (if applied), anywhere.</li> <li>2. The <b>intumescent fire retarding paint</b> authorised in EO MB18-12-1 (current issue) is considered acceptable when the fire retarding paint used by the original manufacturer or approved by the current type certificate holder is not available. Alternate intumescent fire retarding paints intended for aircraft, fibre composite or metal surfaces will be considered upon written application to GFA.</li> <li>3. Cockpit placards listing actions required in the event of engine fire are to be fitted.</li> <li>4. <b>FIREWALLS:</b> Plain steel or stainless steel firewalls must not have flammable insulation or upholstery attached to the cockpit side of the firewall. Refer: Engineering Order MB18-12-1 (current issue), Appendix B, "Firewall Configurations," item (B).</li> </ol>
<b>NON-MANDATORY</b>	<p>The following requirements are <b>ADVISORY</b>:</p>

	<ol style="list-style-type: none"> <li>1. The areas immediately aft of engine cowls on touring motorgliders are vulnerable to fire. Consider applying fire protection (either intumescent paint or alternative means) to all engine cooling air outlets for at least 600 mm aft of the cooling air outlets and 100 mm either side of the cooling air outlets. Refer to AN 175 for guidance</li> <li>2. Plain steel or stainless steel firewalls backed by, and in contact with FRP structure should be brought to Fireproof standard in accordance with AN 175 and Engineering Order MB18-12-1 (current issue), Appendix B "Firewall Configurations," item (C).</li> </ol>
<b>DISPENSATION</b>	It is recognised that not all powered sailplanes will be able to comply with this Airworthiness Directive. Possible dispensation may be discussed with the GFA Chief Technical Officer. However, only if there is a very strong case for non-compliance and the applicant acknowledges and accepts the potential risk
<b>AFFECT ON WEIGHT AND BALANCE</b>	Refer to AN 175 and Section 6 of EO MB18-12-1 (as amended)
<b>COMPLIANCE</b>	Compliance with this Airworthiness Directive is mandatory and compliance, including action taken pursuant to this Airworthiness Directive, must be recorded in the sailplane's log book.
<b>ISSUING AUTHORITY</b>	<p>Issued for and on behalf of <b>The Gliding Federation of Australia Inc.</b></p> <p>Signed:</p>  <p>Chief Technical Officer, Gliding Federation of Australia</p>
<b>Effective Date</b>	October 15, 2019

# GFA AD 687 INSPECTION SCHEDULE

## INTUMESCENT PAINT

A PAINT COVER WHICH, WHEN HEATED EXPANDS UP TO 50 TIMES ITS OWN THICKNESS, THEREBY SHELTERING THE MATERIAL IT IS COVERING, FROM HEAT AND COMBUSTION, UP TO 1093 C.

To assist GFA to gain a picture of our powered sailplane fleet condition, and raise awareness of engine compartment fire hazards, please complete this Inspection Schedule using Engineering Order MB18-12-1 issue 1 as reference and return the completed schedule to the GFA Chief Technical Officer before Nov 30<sup>th</sup>, 2019.

**cto@glidingaustralia.org**

SAILPLANE TYPE	SERIAL NO	VH -	GFA G NUMBER
INSPECTION ITEM	RESULTS		
Is the existing fire retarding paint original?			
Has the original paint been overcoated with an alternative paint? Type of paint used?			
What is the condition? Is the fire retarding paint, flaking, bare spots, fuel / oil saturated? Signs of previous heat damage? A <b>photo</b> of any defects would be helpful.			
Referring to Annex A, what configuration is the firewall. (A), (B), (C), (D)? Construction material?			
If there is upholstery or insulation attached to the cockpit side of the firewall. Is it fire retardant?			
Is there fire retardant paint anywhere on the <b>external</b> airframe as discussed in AN 175 Issue 3. Is the paint original or other?			
The Registered Operator to prepare and fit a cockpit placard (reference AFM or POH), one for each cockpit, listing actions to be performed in the advent of fire. A copy to be included with the return of this inspection schedule. Contact the GFA CTO for advice if necessary.			
INSPECTION COMPLETED BY:			
NAME .....	PLACE .....DATE.....		
GFA Membership No .....	CONTACT .....		

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# **GFA AD 687 ANNEX A**

## **FIREWALL CONFIGURATIONS**

- (A) A normal front engine firewall with nothing attached to it on the cockpit side.
- (B) A front engine firewall with upholstery or carpet attached on the cockpit side.
- (C) A front engine firewall fitted up against a non-fire retarded, FRP structural bulkhead on the cockpit side.
- (D) A firewall at the front and back of a rear, buried, or pop up, engine compartment.