



■ AgustaWestland **AW**<sup>189</sup>

■ **ICING COMPATIBILITY  
REFERENCE HANDBOOK**

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# AgustaWestland **AW<sup>189</sup>**

## **AW189**

### **ICING COMPATIBILITY REFERENCE HANDBOOK**

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## LISTA DELLE REVISIONI - REVISION HISTORY

REVISIONE ISSUE	DESCRIZIONE MODIFICHE CHANGE DESCRIPTION	DATA EMISSIONE ISSUE DATE
<b>A</b>	<i>First Issue</i>	4/8/2015
<b>B</b>	<i>Second Issue. FIPS Added Kit 8G2591F00611 External Hand Hold Added:</i>	16/5/2016
<b>C</b>	<i>Third Issue. FIPS for STD Cabin / Enhanced LIPS Reference added</i>	29/3/2017
<b>D</b>	<i>Fourth Issue. Added kit:</i> <ul style="list-style-type: none"> <li>- Glonass receiver P/N 8G3450F01411, Lower wirestrike system P/N 8G9540F00211</li> <li>- 2nd VUHF Flexcomm II with Control Panel in cabin P/N 8G2310F01811</li> <li>- RADIO TETRA COBHAM 1X P/N 8G2310F01911</li> <li>- AIS TRANSPONDER SAAB R5AS SECURE P/N 8G3450F01711</li> <li>- Silvus SC4410E P/N 8G2320F00111</li> <li>- 8G2120F00411 Kit RHS Avionic Bay Cooling System</li> <li>- 8G3450P03611 Kit Transponder &amp; TCAS II</li> <li>- 8G2315F00211 Kit SATCOM IRIDIUM FLIGHTCELL DZMX</li> <li>- 8G9350F00212 FLIR Star Safire 380-HD</li> </ul>	28/09/2022



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## 1 SCOPE

The scope of this document is:

- to keep trace of the AW189 helicopter configuration cleared for flight into known icing conditions;
- to provide the means to determine if a given AW189 configuration is cleared for flight into known icing conditions.

These two aspects are approached in relation to the Full Ice Protection System (P/N 8G3000F00111 / 8G3000F00311) and the Limited Ice Protection System (P/N 8G3000F00211 / 8G3000F00212).

## 2 REFERENCE DOCUMENTS

[1]	189G0000A002	AW189 - Kit Compatibility Handbook
[2]	189G3000N001	AW189 - LIPS Compliance to Special Condition F-19
[3]	189G3000N002	AW189 - FIPS Compliance to 29.1419 Requirements



### 3 DEFINITIONS

Any modification (kits, equipments or AW189 basic helicopter modification) is defined as "ice sensitive" if one at least of the following conditions are met:

- It has parts, protruding from the helicopter silhouette, which can collect ice with the helicopter flying in an icing condition. Once accreted in such external parts, the ice can shed from the surface in blocks of remarkable dimensions and hit the helicopter critical parts. Ice accreted on the external surfaces can also disturb the airflow to the engine intakes, increase the helicopter drag and therefore significantly reduce its performance or cause an increase in loads and vibrations, leading to structural failures of the helicopter components. Finally the ice accreted on "ice sensitive" items can lead to malfunctions of themselves (for example lights, cameras or antennas).
- It has intakes or openings which can collect ice. Once accreted in these zones the ice can clog the openings, causing malfunction of the item itself.

Therefore, when a modification which involves an "ice sensitive" item has to be certified, the modification must be ice cleared in respect of the LIPS/FIPS kit following the logic described in this document, because excessive ice accreted on the item itself can put the helicopter into hazardous conditions for one of the reasons above, or cause the malfunction of that item. In this case the malfunction of the part due to ice accretion does not necessarily prevent the ice clearance, provided that the helicopter can safely fly in ice.

Once the modification is assessed from an ice accretion point of view, it has to be verified also from an HIRF/EMC point of view, with the aim of assessing if the electromagnetic compatibility with the FIPS and LIPS kit (see Ref [1]).

### 4 ICE CLEARANCE LOGIC

The AW189 is allowed to fly into known icing conditions by installing and operating the Full Ice Protection System or the Limited Ice Protection System.

FIPS is certified to permit the helicopter to safe operate within the entire envelope defined in CS29 Appendix C - Icing Certification without any limitation

LIPS, is limited in LWC and OAT in order to provide a boundary within the helicopter can safely operate according to the CS29 regulations.

For this scope of this document is to provide a list of the "ice sensitive" kits which can be installed and operated with FIPS and LIPS.

In order for a given AW189 configuration to be considered ice cleared, all the conditions here below have to be positively assessed:

- The FIPS P/N 8G3000F00111/8G3000F00311 or the LIPS P/N 8G3000F00211/8G3000F00212 must be installed .





- All "ice sensitive" kits, equipments or modifications installed are included in the Annex A of this document; If one of the ice cleared equipments here included is installed, it has to be verified that the relevant restriction is applied.

In case the EMC compatibility of a kit with the Limited or Full Ice Protection System cannot be granted, the kit will be declared incompatible with FIPS or LIPS in the Kit Compatibility Handbook (Ref [1]).

## 5 PLACARDS

With the FIPS installed (configuration cleared in icing) the following placard is required:

APPROVED TYPES OF OPERATION  
VFR (DAY/NIGHT) /IFR  
ICING CONDITIONS  
FLT IN FREEZING RNDZ/SLD PROHIBITED

With the LIPS installed (configuration cleared in icing) the following placard is required:

APPROVED TYPES OF OPERATION  
VFR (DAY/NIGHT) /IFR  
LIMITED ICING CONDITIONS  
FLT IN FREEZING RNDZ/SLD PROHIBITED

If the helicopter configuration is not cleared in ice the placard has to be replaced with the basic AW189 one, reported here below:

APPROVED TYPES OF OPERATION  
DAY/NIGHT VFR  
DAY/NIGHT IFR  
ICING PROHIBITED

## 6 CHANGES TO APPROVED CONFIGURATION

Any change in the AW189 configuration, if considered "ice sensitive" or causing HIRF/EMC interferences with the FIPS or LIPS, has to be cleared for flight into known icing conditions.

Modifications can be introduced to the "ice sensitive" items, to allow the icing clearance to be obtained, such as aerodynamic fairings (reducing the ice collection of the protruding parts), passive or active protection of the surfaces (screens, electro-thermal heating, pneumatic boots or other means).

The clearance for flight into known icing conditions of STC installations and modifications is completely upon responsibility of the STC holders.



# ANNEX A

TITLE

## LIST OF ICE CLEARED EQUIPMENTS



This annex contains the list of equipments cleared for flight into known ice conditions.

For the FIPS and LIPS, the table below:

- includes all the ice sensitive equipments positively assessed in icing conditions
- doesn't include non-sensitive equipments which, when installed in accordance with the approved drawings, can be considered cleared into known icing conditions (once tested for EMC interference);
- doesn't include ice sensitive equipments not cleared in icing conditions.

The first two columns include the P/N and description of the equipment.

Then the restrictions and the ice clearance are reported. The restriction reported must be applied to consider the kit ice cleared. If the box is left blank no modifications are required to the equipment, which can be therefore safely installed in an ice cleared configuration.

The AW189 basic configuration is approved as per TC EASA.R.510 dated 7/2/2014. Modification to this configuration, as the addition of new kits or equipments, if considered "ice sensitive", has to be cleared against FIPS and LIPS condition before being considered approved.



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P/N	KIT DESCRIPTION	FIPS		LIPS	
		RESTRICTION	CLEARANCE	RESTRICTION	CLEARANCE
4F4390F00111	SATCOM SKYTRAC		YES		YES
4F5630F00111	Copilot Storm Windows		YES		YES
8G0000X00931/ 8G0000X00831	Underbelly Tank Kit		YES		YES
8G2120F00111	Forced Ventilation		YES		YES
<a href="#">8G2120F00411</a>	<a href="#">Kit RHS Avionic Bay Cooling System</a>		<a href="#">YES</a>		<a href="#">YES</a>
8G2150F00111	Air Conditioning		YES		YES
8G2310F00511 (UbT) 8G2310F00111	V-UHF Flexcomm II		YES YES		YES YES
8G2310F00611 (UbT) 8G2310F00311	HF Radio		YES YES		YES YES
8G2310F00711 (UbT) 8G2310F00211	Radio VHF/FM Maritime NPX138		YES YES		YES YES
8G2310A03311 (8G2310P00511)	Radio Tetra Antenna		YES		YES
8G2310F01811 (UbT) <sup>1</sup>	2nd VUHF Flexcomm II with Control Panel in cabin		YES		YES
<a href="#">8G2310F01911 (UbT)</a>	<a href="#">Radio Tetra Cobham 1X</a>		<a href="#">YES</a>		<a href="#">YES</a>
<a href="#">8G2320F00111 (UbT)</a>	<a href="#">Silvus SC4410E</a>		<a href="#">YES</a>		<a href="#">YES</a>
8G2350F01111	External Loudspeaker (700W)		YES		YES
8G2350F01311	Wireless ICS Polycon (VHF/UHF)		YES		YES
8G2560F00311	ELT deployable		YES		YES
8G2560F00511	Life Rafts		YES		YES
8G2591F00311	Double Rescue Hoist		YES		YES
8G2591F00611	Kit External Hand Hold Extension		YES		YES
8G2592F00111	Cargo Hook		YES		YES
8G3040F00111	Windshield wipers-washing		YES		YES

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P/N	KIT DESCRIPTION	FIPS		LIPS	
		RESTRICTION	CLEARANCE	RESTRICTION	CLEARANCE
8G3080F00211	Kit Vernier Ice Accretion Meter		YES		YES
8G3340F00111	Kit Hover Lights		YES		YES
8G3340F00211	Strobe lights (winglets)		YES		YES
8G3340F00411	Main Rotor Tip Lights		YES		YES
8G3340F00611 (UbT) 8G3340F00511	Tail Rotor Tip Lights		YES		YES
8G3340F00811	Search Light Trakka A800 Search Light		YES		YES
8G3340F00911 (UbT)	External flood lights		YES		YES
8G3340F01011 (UbT)	Secondary Hoist Light		YES		YES
8G3340F01111 (UbT) 8G3340F01211	Primary Hoist Light		YES YES		YES YES
8G3340F01811 (UbT) 8G3340F01711	2 <sup>nd</sup> Anti-collision light		YES YES		YES YES
8G3430F00111	External Glideslope Antenna		YES		YES
8G3450F00411 (UbT) 8G3450F00111 <a href="#">8G3450P03611</a>	TCAS II		YES YES		YES YES
8G3450F00511	DF 935-11		YES		YES
8G3450F00611 (UbT) 8G3450F00311	AIS Transponder		YES YES		YES YES
8G3450F00711	3RD GPS ANTENNA		YES		YES
8G3450F01111	Kit ADF Tail		YES		YES
<a href="#">8G3450F01311</a>	<a href="#">Kit GBAS Receiver</a>		<a href="#">YES</a>		<a href="#">YES</a>
<a href="#">8G3450F01411</a>	<a href="#">Kit Glonass receiver</a>		<a href="#">YES</a>		<a href="#">YES</a>
<a href="#">8G3450F01511</a>	<a href="#">Kit new Global Navigation Satellite System (GLONASS) receiver</a>		<a href="#">YES</a>		<a href="#">YES</a>
<a href="#">8G3450F01711 (Ubt)</a>	<a href="#">AIS Transponder Saab R5AS Secure</a>		<a href="#">YES</a>		<a href="#">YES</a>

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P/N	KIT DESCRIPTION	FIPS		LIPS	
		RESTRICTION	CLEARANCE	RESTRICTION	CLEARANCE
8G4390F00111 <a href="#">8G2315F00211 (Ubt)</a>	SATCOM SKYCONNECT		YES		YES
8G4390F00411	SATCOM Iridium Flightcell DZMX		YES		YES
8G5260F00111	Cockpit & Cabin Footstep		YES		YES
8G5620F00111	Bubble windows		YES		YES
8G9350F00211 (UbT) <a href="#">8G9350F00212(UbT)</a>	FLIR Star Safire 380 HD		YES		YES
<a href="#">8G9350F00411</a>	<a href="#">Kit LEOSS</a>		<a href="#">YES</a>		<a href="#">YES</a>
8G9370F00111	Radar Telephonics RDR-1500B+	Installation of the Long Nose P/N 8G5240A04811	YES	Installation of the Long Nose P/N 8G5240A04811	YES
8G9540F00111	Wire strike protection system		YES		YES
<a href="#">8G9540F00211</a>	<a href="#">Wire strike protection system lower</a>		<a href="#">YES</a>		<a href="#">YES</a>
8G9560F00211	Emergency floats		YES		YES
8G9750F00411 (UbT)	Hoist Camera		YES		YES
<a href="#">8G9750F00811</a>	<a href="#">KT EVS MAX VIZ 2300</a>		<a href="#">YES</a>		<a href="#">YES</a>
8G9770F00111 8G9770F00211 (UbT)	Cargo Hook Camera		YES		YES

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