Supplement No. AFS-AW139-IBF-FMS

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17891 Chesterfield Airport Road
Chesterfield, MO 63005

FAA APPROVED
ROTORCRAFT FLIGHT MANUAL SUPPLEMENT
TO THE

AGUSTA S.p.A.
MODELS AB139 AND AW139
ROTORCRAFT FLIGHT MANUAL
FOR THE
INLET BARRIER FILTER SYSTEM
INSTALLATION

Aircraft S/N _____ Aircraft Reg. No. _____

This supplement must be attached to applicable FAA Approved Rotorcraft Flight Manual, when the rotorcraft is modified by the installation of the AFS Inlet Barrier Filter (IBF) System in accordance with STC No. SR02772CH

The information contained herein supplements or supersedes the basic manual only in those areas listed herein. For limitations, procedures, and performance information not contained in this supplement, consult the basic Rotorcraft Flight Manual.

FAA Approved

FOR Steven Lardinois
Manager, Systems and Flight Test, ACE-117C
Federal Aviation Administration
Des Plaines, IL 60018

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LOG OF REVISIONS

Revision No.	Revision Description	Pages Effected	FAA Approved:	Date:
IR	Initial Release	All	E.M. Ward	30 Oct 09
A	Removed "IMC" restriction	All	Joseph Miess	8 Mar 10
B	Removed CAT A restriction, and revised Limitations and Performance Sections	5 & 10	Joseph Miess	25 May 10
C	Changed Logo on Cover Sheet, Changed Address on all Sheets	All	Superseded	
D	Added Placard to Limitations	5	Joseph Miess	31 May 11
E	Revised CAT A Supplement reference	11	Ronald D. Ward FEB 26 2013	

NOTE

Revised text from previous revision is indicated by a black vertical line in the right border.

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GENERAL INFORMATION

AFS INLET BARRIER FILTER (IBF) CONFIGURATION

The IBF (configuration 122000-001) consists of a left hand and right hand frame assembly, left hand and right hand forward and aft fairings, two filter assemblies per side, two cockpit indicator/switches, and bypass system for each engine/system which includes the bypass door, actuator, differential pressure switch, and filter maintenance aid.

The IBF system provides a means of monitoring the condition of the filters for each engine, both in-flight and on the ground, and bypass capabilities for each engine should flow through any of the filters become restricted. In-flight, the differential pressure switch continuously measures the drop in pressure across the filters, and triggers the cockpit indicator/switch(s) for affected engine, cautioning the pilot any time the differential pressure across the filters reaches or exceeds a preset limit.

The electromechanically actuated bypass door (located on the bottom of the filter frame assembly), permits unfiltered air to enter the engine inlet chamber (on the affected engine), should the filter media become obstructed, and can be opened or closed as required by depressing the respective cockpit indicator/ switch. Each bypass system is employed by depressing the respective cockpit indicator/ switch on the instrument panel. The bypass system also includes a three amp circuit breaker located in the overhead panel, installation hardware and wiring.

Each cockpit indicator/switch is used to energize the respective actuator by depressing the switch to open the bypass door and depressing it to close the bypass door. When the filters have enough dirt/ debris that causes the differential pressure to reach or exceed a preset value, the “FILTER” segment of the indicator will illuminate. The cockpit indicator/ switch may be depressed to open the bypass door. When the bypass is fully opened, the “BYPASS” segment of the indicator will illuminate, and the differential pressure will decrease causing the “FILTER” light to extinguish. On the ground, a Filter Maintenance Aid, mounted on the lower, aft portion of the filter frame assembly for each engine, displays the maximum differential pressure across the filters reached during the last flight. It is accessible only on the ground, providing the pilot or mechanic the ability to visually gauge the current condition of the filters.

Operation of the aircraft with the IBF system installed requires use of the same OEM performance information and/or charts (basic or EAPS) as required in the Rotorcraft Flight Manual (RFM) for all operations as defined in Section 4 of this supplement. Therefore no new performance charts are required for installation and operation of the IBF system.

AFS FOREIGN OBJECT DAMAGE (FOD) SCREEN CONFIGURATION

The optional FOD Screen configuration consists of all the same basic components as the IBF system except that FOD Screens assemblies are installed in lieu of the IBF filter assemblies. The screens and filters are interchangeable.

Section 1

LIMITATIONS

TYPE OF OPERATION

Operation of the aircraft with the IBF system installed and configured with filters (122300-101 and 1223350-101) allows Category A operations. For CAT A operations, all CAT A Limitations, Restrictions, and Operations listed in the RFM must be followed, to include Daily Engine Power Check procedures in RFM Part G – Common Performance. Refer to the Limitations Section of the RFM and or supplements for Types of Operation.

The installation of the IBF system does not restrict the aircraft from flight in falling and blowing snow conditions.

For the Filter Configuration, only filters must be installed (LH upper and lower and RH upper and lower). For the FOD Screen configuration only FOD Screens must be installed (LH upper and lower and RH upper and lower). No mixing of Filters and FOD Screens is allowed.

INSTRUMENT MARKINGS AND PLACARDS

Only on aircraft with Icing Protection System installed:

APPROVED TYPES OF OPERATION

DAY/NIGHT VFR
DAY/NIGHT IFR

ICING PROHIBITED

The above reversible placard (Agusta p/n 3G1130L00255) must be installed on instrument panel with this side visible when aircraft is configured with IBF system installed.

On all AB139/AW139 aircraft:

IBF 1

Placard is located near the #1 engine 3 amp circuit breaker in the center pedestal and near the #1 engine indicator/switch.

IBF 2

Placard is located near the #2 engine 3 amp circuit breaker in the center pedestal and near the #2 engine indicator/switch.

NOTE: "IBF 1" and "IBF 2" may be engraved or silk-screened in lieu of the placards



Amber



Amber

The indicator/switch (both conditions shown) is to open/close the filter bypass and alert the pilot of filter restriction in the affected inlet and when the affected bypass door is open. The switch is segmented to indicate two conditions:

The “FILTER” segment of the switch will illuminate when the pressure differential (in the respective engine) pressure is above a preset value.

The “BYPASS” segment of the switch will illuminate whenever the bypass door is open.

NOTE:

The “FILTER” segment should be extinguished when the “BYPASS” segment is illuminated.

Section 2

NORMAL PROCEDURES

FUSELAGE – CENTER

1. Ensure IBF environmental protective covers are removed.

2. Perform a visual check to verify that the bypass doors are in the closed position.

3. Check IBF Filter Maintenance Aid to determine condition of the filters. When indicator enters RED zone (See Figure 2-1 of this FMS), it is recommended the filter be serviced per IBF Instructions for Continued Airworthiness, AFS-AW139-IBF-ICA.

BEFORE FLIGHT WHEN OPERATING IN SNOW CONDITIONS

1. Thoroughly check cabin roof, transmission cowling, and filter areas. All areas checked shall be clean and free of accumulated snow, slush, and ice before each flight.

2. Ensure that all filters, by-pass doors, and intake cowling are thoroughly clear of snow, slush, or ice before each flight.

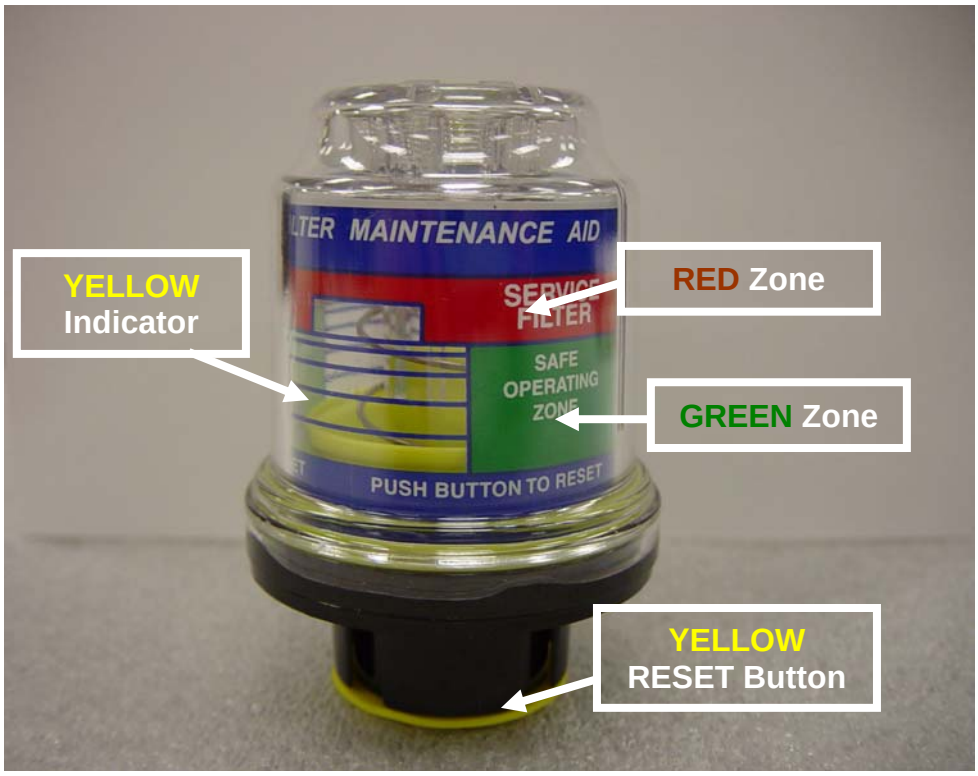

Figure 2-1. FILTER MAINTENANCE AID – (ABOVE) "YELLOW Indicator" position relative to SAFE OPERATING ZONE ("GREEN Zone") or SERVICE FILTER ("RED Zone") markings defines current filter condition and pushing "YELLOW RESET Button" resets indicator. (BELOW) FMA unit is mounted to front of the upper plenum of IBF assembly and is accessed through access hole in the cover plate.



Section 3

EMERGENCY/MALFUNCTION PROCEDURES

Caution (amber) lights

PANEL WORDING	FAULT CONDITION	CORRECTIVE ACTION
"FILTER"	Illumination of the "FILTER" segment of the respective indicator/switch indicates the preset value for the pressure differential for the affected engine has been reached. NOTE As the filter becomes more contaminated, certain flight conditions may cause the "FILTER" segment to flicker intermittently. Corrective action should be taken only when the "FILTER" segment illumination is continuous.	Monitor ITT for any significant rise, i.e. > 20°C. Monitor engine conditions for any indications of engine degradation or compressor stall, i.e. ITT fluctuations, and decreasing or fluctuating N1 rpm. If rise in ITT or engine performance is unacceptable: ▪ Open affected bypass door by pressing illuminated "FILTER" indicator/switch. ▪ "BYPASS" segment of indicator/switch should illuminate and the "FILTER" segment of indicator/switch should extinguish indicating the bypass door is open and the pressure differential is back within the normal range. Service filters prior to next flight. NOTE If either or both of the "FILTER" lights illuminate during take-off, recommend servicing filters before continuing flight. CAUTION TO PREVENT COMPRESSOR EROSION AVOID (IF POSSIBLE) OPERATION IN DIRTY OR DUSTY ENVIRONMENT WITH THE BYPASS DOOR OPEN.
"BYPASS"	The bypass door is open and the filter is being bypassed with unfiltered air entering the engine	If the flight or landing environment has significant dirt or debris, it is recommended that the bypass door be closed, provided no rotorcraft or engine limits will be exceeded. With the bypass closed, the "BYPASS' segment will extinguish and the "FILTER" segment will potentially re-appear under high engine power settings until the filter has been cleaned
	Inadvertent encounters with icing	Exit condition as soon as practical.

Section 4

PERFORMANCE

INLET BARRIER FILTER (IBF) CONFIGURATION

When the Inlet Barrier Filter (IBF) system STC is installed, use the basic Hover Power Assurance Check (PAC) chart to determine engine health. If the PAC is satisfactory (i.e. the recorded ITT or NG values are less than the maximum allowable values) then basic performance can be obtained and the basic performance data charts are applicable.

If the basic PAC is not satisfactory (i.e. the recorded ITT or NG values are greater than the maximum allowable basic values) then published performance may not be achieved. If this is the case, either clean the filters and recheck the engine health using the basic Hover Power Assurance Check chart or compare the recorded Power Assurance Check values against the Engine Air Intake Particle Separator (EAPS) chart located in the Engine Air Intake Particle Separator (EAPS) supplement.

If engine health is found to be satisfactory using the EAPS Hover Power Chart (i.e. the recorded ITT or NG values are less than the maximum allowable EAPS values), then the EAPS performance can be obtained and the EAPS performance data charts are applicable. If the engine health is not satisfactory then clean the filters and conduct another Hover Power Assurance Check, and compare the results to the basic Hover Power Assurance Check chart or the EAPS Power Assurance Check chart.

If the recorded PAC results after cleaning the filters are still not satisfactory (i.e. the recorded ITT or NG values are greater than the maximum allowable basic or EAPS values), then contact maintenance for troubleshooting.

CAUTION

Helicopter performance is reduced as the IBF becomes contaminated with dirt, dust and debris. The pilot/operator is responsible to utilize the PAC to determine if the engine can produce installed power.

Ensure that the IBF FILTER caution lights are not illuminated during performance of the PAC, and the bypass door is closed.

FOREIGN OBJECT DAMAGE (FOD) SCREEN CONFIGURATION

When the AFS FOD Screen is installed, use of the Rotorcraft Flight Manual the basic helicopter procedures and data found in the performance section (Section 4 of the RFM) are applicable.

ALL CONFIGURATIONS

The frequency at which the PACs are conducted is up to the discretion of the operator and may be based on the current or forecast operating environment, (i.e. temperature, altitude, airborne contaminate) and the requirements of the Flight Manual or applicable Flight Manual Supplement.

If the engine does not pass PAC, published performance may not be achieved. Contact maintenance for appropriate trouble shooting procedures as outlined in the applicable Instructions for Continued Airworthiness or Maintenance Manuals.

CATEGORY A OPERATIONS

A daily Engine Power Check procedure as described in the Rotorcraft Flight Manual, CAT A Supplement (Common Performance) must be performed prior to CAT A Operations.

Perform the Power Assurance Check as described in the RFM CAT A Supplement and compare the ITT and NG results to the Power Assurance Check Chart. If neither the ITT or NG values exceed the chart values, CAT A Operations may be performed using the CAT A charts. If either engine exceeds allowable ITT or NG, published performance may not be achievable.

If either engine exceeds the allowable ITT or NG values, check the ITT and NG values to the Power Assurance Check, EAPS INSTALLED chart. If neither the ITT or NG values exceed the EAPS INSTALLED chart values, CAT A Operations may be performed using the EAPS OFF charts. If either engine exceeds allowable ITT or NG, published performance may not be achievable and CAT A Operations are prohibited.

Section 5

OPTIONAL EQUIPMENT SUPPLEMENTS

Not Applicable

Section 6

WEIGHT AND BALANCE

Actual weight and CG to be determined at the time of installation and entered into the aircraft log book. It is encouraged that both configurations (Filters and FOD Screens) are weighed and each configuration be entered into the logbook.

The IBF system consists of permanent components and filters, or screens. The permanent components weight should be considered part of the aircraft permanent weight and balance record and should be annotated in the aircraft logbook. Since the pilot has the option of using either the Filter or FOD Screen configurations, the weights for each configuration are listed below. It is the responsibility of the pilot/operator to know which configuration is installed and using the weights listed on this page to ensure the aircraft remains within the CG limits. If maintenance has weighed each configuration and entered the appropriate data for each configuration into the logbook, then the pilot may use that data for determining aircraft weight and balance compliance. Otherwise using the data below, the weight and balance for either configuration may be determined.

FILTER WEIGHTS

LH Upper and Lower Filters –	14.73 lb
RH Upper and Lower Filters –	14.73 lb
Total Filter Wt. (LH and RH) –	29.46 lb

The Approximate IBF Filter Configuration CG is located at STA. 257.3

FOD SCREEN WEIGHTS

LH Upper and Lower Screens –	8.95 lb
RH Upper and Lower Screens –	8.95 lb
Total FOD Screen Wt. (LH and RH) –	17.90 lb

The Approximate FOD Screen Configuration CG is located at STA. 257.3