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17891 Chesterfield Airport Road  
Chesterfield, MO 63005

**TCCA 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. \_\_\_\_\_

Sections General, 1, 2, 3, 4, 5 and 6 of this document comprise the approved Rotorcraft Flight Manual Supplement. Compliance with Section 1, Limitations, is mandatory.

The information and data contained in this document supersede or supplement that contained in the basic approved Rotorcraft Flight Manual for the Agusta S.p.A. AB139 and AW139 helicopters in the areas listed herein. For limitations, procedures and performance not contained in this document, refer to the approved Rotorcraft Flight Manual and other applicable approved Rotorcraft Flight Manual Supplements.

This supplement must be attached to the approved Rotorcraft Flight Manual when the rotorcraft is modified by the installation of the AFS Inlet Barrier Filter (IBF) System in accordance with TCCA STC No. \_\_\_\_\_

TCCA Approved \_\_\_\_\_

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**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.

When IBF is installed in the Filter configuration (with Filters 122300-101, 122300-102, 122350-101, and 122350-102 installed) aircraft is prohibited from flight in ambient temperatures less than, or equal to, +5 degrees Celsius.

When IBF is installed in the FOD screen configuration (with FOD screens 122325-101, 122325-102, 122375-101, and 122375-102 installed) aircraft is prohibited from flight into falling and blowing snow, and also from flight in re-circulating snow, except for take-off and landing.

For aircraft with FIPS (Full Icing Protection System), IBF circuit breaker must be pulled and secured when FIPS engine doors are installed. The above restrictions do not apply.

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

**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

#### 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 Filters or AFS FOD Screens installed.



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**

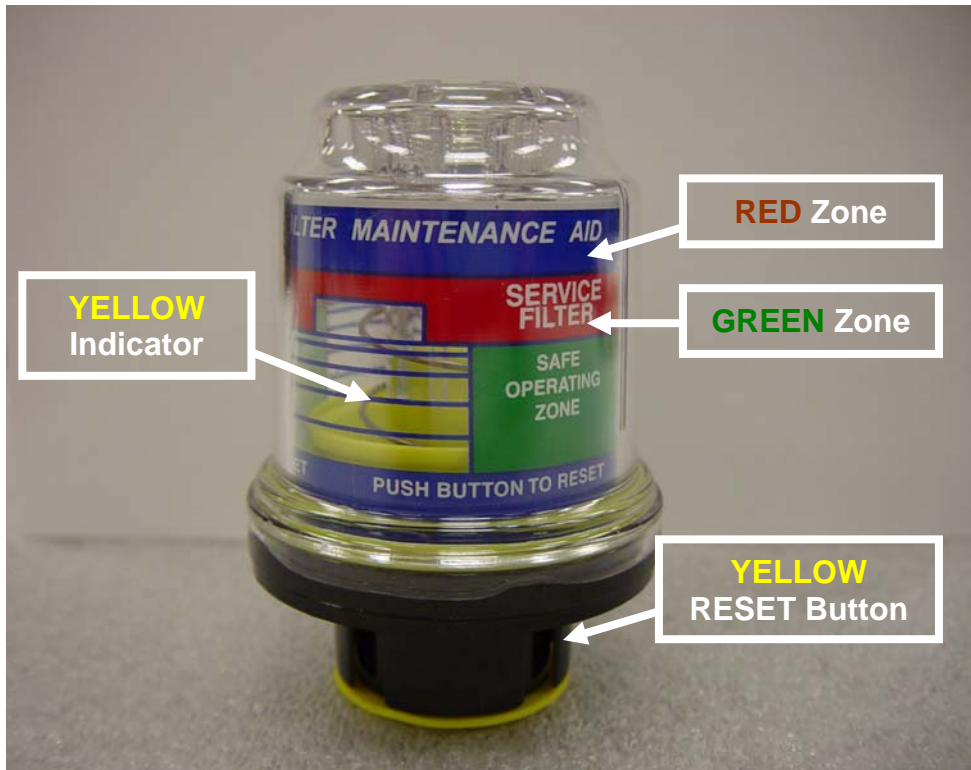
### **NORMAL PROCEDURES**

#### **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
<p>"FILTER"</p>	<p>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.</p> <p style="text-align: center;">NOTE</p> <p>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.</p>	<p>Monitor ITT for any significant rise, i.e. &gt; 20°C. Monitor engine conditions for any indications of engine degradation or compressor stall, i.e. ITT fluctuations, and decreasing or fluctuating N1 rpm.</p> <p>If rise in ITT or engine performance is unacceptable:</p> <ul style="list-style-type: none"> <li>▪ Open affected bypass door by pressing illuminated "FILTER" indicator/switch.</li> <li>▪ "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.</li> </ul> <p>Service filters prior to next flight.</p> <p style="text-align: center;">NOTE</p> <p>If either or both of the "FILTER" lights illuminate during take-off, recommend servicing filters before continuing flight.</p> <div style="text-align: center;">  </div> <p>TO PREVENT COMPRESSOR EROSION AVOID (IF POSSIBLE) OPERATION IN DIRTY OR DUSTY ENVIRONMENT WITH THE BYPASS DOOR OPEN.</p>
<p>"BYPASS"</p>	<p>The bypass door is open and the filter is being bypassed with unfiltered air entering the engine</p>	<p>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</p>

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.



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 troubleshooting 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, Part G 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
<hr/>	
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
<hr/>	
Total FOD Screen Wt. (LH and RH) –	17.90 lb

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