Supplement No. AFS-EC130-IBF-FMS

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FAA APPROVED
ROTORCRAFT FLIGHT MANUAL SUPPLEMENT
TO THE

AIRBUS HELICOPTERS
MODELS EC130B4, EC130T2, AND AS350B3 w/Dual HYDRAULICS
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 DCI Inlet Barrier Filter (IBF) System in accordance with STC No. SR02560CH.

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: ROBERT KLASE Digitally signed by ROBERT KLASE Date: 2022.02.24 13:04:01 -06'00'
for Monica Merritt Manager, Southwest Flight Test Section, AIR-713
Federal Aviation Administration
Ft. Worth, TX

Approval Date: FEB 24 2022

Revision: H

LOG OF REVISIONS

Revision No.	Revision Description	Pages Effected	FAA Approved:	Date:
IR	Initial Release	All	E. Michael Ward	Aug. 29 2008
A	Added AS350B3 w/dual hydraulics to eligible aircraft	All	Joseph C. Miess	15 Sep 2008
B	Changed Logo and Address Changed Performance section to add Arriel 2D engine requirements	All	Joseph C. Miess	19 Sep 2011
C	Revised Performance Section to add sand filter charts to the Arriel 2D engine equipped aircraft and update to the latest format.	All	E.M. Ward	13 Jul 2012
D	Added Note to Performance Section, Removed Arriel 2D engine from VEMD Sand Filter programing requirements	10	Joseph C. Miess	26 Nov 2012
E	Updated circuit breaker placard location call-out	5	E.M. Ward	16 Apr 2014
F	Added EC130T2 model to associated performance information, Updated Mfg. name to Airbus Helicopters	Cover, 10	W.J. Jaconetti	23 Sep 2014
G	Replaced all instances of Aerospace Filtration Systems and AFS with Donaldson Company, Inc. and DCI. Added segment 'Before Flight When Helicopter is uncovered and exposed to rain' to Section 4. Revised Figure from 2-1 to 4-1 in Section 4. Revised segment 'Hydraulics' and 'For EC130T2 with Arriel 2D Engines Only' in Section 5. Added segment 'For AS350B3 with Arriel 2D Engines Only' to Section 5.	All	Anthony T. Flores	17 Dec 2018
H	Added NORMAL PROCEDURES cont. title to page 9 in Section 4. Revised performance procedures For EC130T2 with Arriel 2D Engine Only in Section 5. Revised AS350B3 with Arriel 2D Engine Only segment in Section 5 to include VEMD Power Increase "H125 Power" (MOD EC07.5102).	9-13	ROBERT KLASE Digitally signed by ROBERT KLASE Date: 2022.02.24 13:04:41 -06'00'	

NOTE

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

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Section 1

GENERAL INFORMATION

The Inlet Barrier Filter (IBF) STC kit (121001-101) consists of a structural kit and an electrical kit. The structural kit consists of an aluminum structure, a filter assembly, a bypass door, differential pressure switch, filter maintenance aid, and integral seals. The engine interfaces with the aluminum channel part of the structure secured to the underside of the cowling. There is also a cockpit indicator/switch, circuit breaker, installation hardware and wiring.

The IBF system provides a means of monitoring the condition of the filter both in-flight and on the ground, and a bypass capability allowing inlet airflow to bypass the filter should the filter become restricted. In-flight, the differential pressure switch measures the drop in pressure across the filter, and triggers the cockpit indicator/switch alerting the pilot any time the differential pressure across the filter reaches or exceeds a preset value.

The electromechanically actuated bypass door permits unfiltered air to enter the engine inlet chamber, should the filter become obstructed, and can be opened or closed as required. The bypass system employs a cockpit indicator/switch on the instrument panel. The bypass system also includes a three amp circuit breaker located in the circuit breaker panel, installation hardware and wiring.

The cockpit indicator/switch is used to energize the actuator by pressing the switch to open the bypass door and pressing again to close the bypass door. When the filter has 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 pressed 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 go out.

On the ground, a Filter Maintenance Aid, mounted to the forward left-hand side of the firewall, displays the maximum differential pressure across the filter 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 filter.

Operation of the aircraft with the IBF system installed requires use of the same performance information and/or charts as required in the Rotorcraft Flight Manual (RFM) for all operations as defined in Section 5 of this supplement. Therefore no new performance charts are required for installation and operation of the IBF system.

Section 2

LIMITATIONS

TYPE OF OPERATION

The installation of the IBF system does not change the existing operational restrictions listed in the basic Rotorcraft Flight Manual (RFM) or existing flight manual supplements. Refer to the Limitations Section of the RFM and/or supplements for Types of Operation, except as noted below.

The installation of the IBF system allows the aircraft to operate in falling and blowing snow conditions.

INSTRUMENT MARKINGS AND PLACARDS

IBF

"IBF" placards (as shown above) are located (1) near the IBF 3-amp circuit breaker and (2) near the IBF cockpit indicator/switch.
.

NOTE

"IBF" may be engraved or silk-screened in lieu of the placards



The indicator/switch includes a push-button switch used to open/close the filter bypass and two indicator segments used to alert the pilot any time the filter is restricted or the affected bypass door is open.



The upper segment of the indicator is labeled "FILTER" and will illuminate yellow/amber when the pressure differential across the respective engine inlet filter is above a preset value.



The lower segment of the indicator is labeled "BYPASS" and will illuminate yellow/amber whenever the bypass door is in the full open position.

NOTE:

"FILTER" segment should extinguish when "BYPASS" segment illuminates indicating differential pressure is again within normal operating range.

Section 3

EMERGENCY/MALFUNCTION PROCEDURES

Caution Lights (YELLOW/AMBER)

Panel wording	Fault condition	Corrective action



Illumination of "FILTER" segment of the cockpit indicator/switch indicates the pressure differential preset value for the inlet has been reached or exceeded.

NOTE

As the filter becomes more contaminated, certain flight conditions may cause "FILTER" segment to flicker intermittently. Corrective action should be taken only when the "FILTER" segment illumination is continuous.

Monitor TOT or T_4 for any significant rise, i.e. > 20°C. Monitor engine conditions for any indications of engine degradation or compressor stall, i.e. TOT or T_4 fluctuations, and decreasing or fluctuating N1 rpm.

If rise in TOT or T_4 or the 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 filter prior to next flight.

NOTE

If the "FILTER" light illuminates during take-off, recommend servicing filter before continuing flight.

CAUTION

TO PREVENT COMPRESSOR EROSION AVOID (IF POSSIBLE) OPERATION IN CONTAMINATED ENVIRONMENT WITH THE BYPASS DOOR OPEN.



Illumination of "BYPASS" segment of the cockpit indicator/switch indicates the bypass door is open and the filter is being bypassed allowing un-filtered air to enter 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.

EMERGENCY AND MALFUNCTIONS PROCEDURES (cont.)

ENVIRONMENTAL CONDITIONS

Fault condition	Corrective Action
Inadvertent encounters with icing conditions	Exit condition as soon as practical.

ELECTRICAL

Fault condition	Corrective Action
Tripped Circuit Breaker	Monitor TOT or T_4 for any significant rise, i.e. > 20°C. Monitor engine conditions for any indications of engine degradation or compressor stall, i.e. TOT or T_4 fluctuations, and decreasing or fluctuating N1 rpm. ▪ Contact maintenance after landing If rise in TOT or T_4 or the engine performance is unacceptable, i.e. approaching engine limits: ▪ Land as soon as practicable

Section 4

NORMAL PROCEDURES

PRE-FLIGHT CHECK

FUSELAGE – CENTER

1. Ensure IBF environmental protective cover is removed.

2. Perform a visual check to verify that filter bypass door is closed.

3. Check IBF Filter Maintenance Aid (FMA) on the LH side forward of the firewall, to determine condition of the filter. When indicator enters **RED** zone (See Figure 4-1 of this supplement), it is recommended filter be serviced per IBF Instructions for Continued Airworthiness, AFS-EC130-IBF-ICA. The FMA gives the operator an idea of the filter condition and can be used to determine filter contamination trends in various environmental conditions. As the filter become increasingly dirty, the yellow indicator will start moving toward the **RED** zone.

4. Check IBF filter element media for security and condition. If any element is torn, has a hole, or the pleats are flat, contact maintenance for disposition per the IBF ICA.

NOTE:

During high airspeeds (i.e. V_H, V_{NE}, etc.), it is possible that the FMA will show the indicator close to or into the **RED** zone. If this is the case, reset the FMA and check after the next flight.

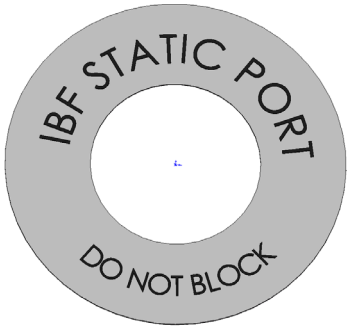
BEFORE FLIGHT WHEN OPERATING IN SNOW CONDITIONS

1. Thoroughly check cabin roof, intake cowling, and filter areas. All areas checked shall be clean and free of accumulated snow, slush, and ice before each flight. (Do not use a broom to brush snow off filter)

2. Ensure that the filter, by-pass door, and intake cowling are thoroughly clear of snow, slush, or ice before each flight.

BEFORE FLIGHT WHEN HELICOPTER IS UNCOVERED AND EXPOSED TO RAIN

1. Check filter for standing water in between the pleats of the media. If standing water is observed, remove the filter, flip upside down, shake until water is removed and then reinstall filter.



The IBF static port placard is located on the aft upper left hand corner of the cowling surrounding the static port.

NORMAL PROCEDURES (cont.)

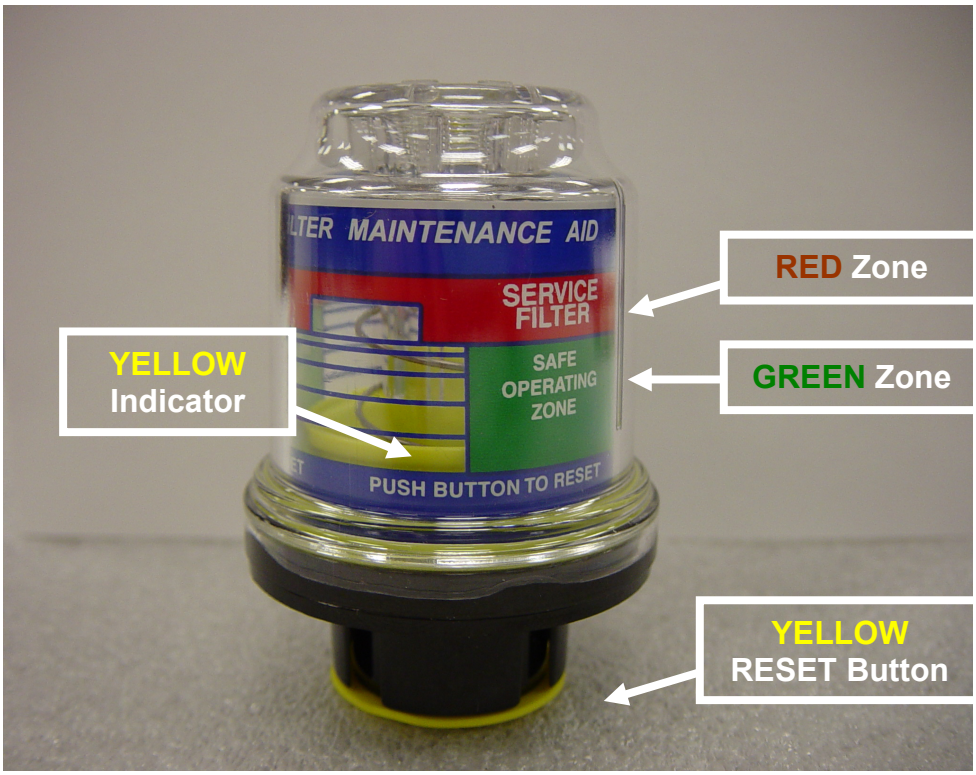
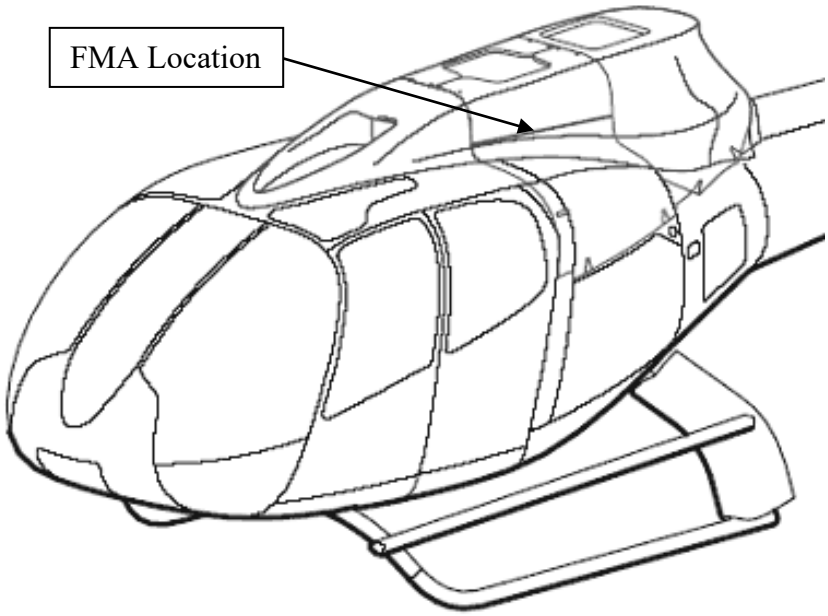


Figure 4-1: FILTER MAINTENANCE AID – (ABOVE) "YELLOW Indicator" position relative to SAFE OPERATING ZONE ("GREEN Zone") or SERVICE FILTER ("RED Zone") markings defines current filter condition and pushing "YELLOW RESET Button" resets indicator. (BELOW) FMA unit is mounted to forward side of the firewall and can be viewed by opening the LH Lateral Cowling Assy.



Section 5

PERFORMANCE

NOTE

The Power Assurance Checks (PAC) procedures must be strictly followed in accordance with the Rotorcraft Flight Manual.

For All EC130B4 and AS350B3 with Dual Hydraulics (with VEMD Programmed for Basic Inlet) – Excluding Helicopters with Arriel 2D Engines

When the Inlet Barrier Filter (IBF) system STC is installed, and the VEMD is programmed for the Basic Inlet, use the basic inlet Engine Power Check (EPC) chart to determine engine health. If the EPC is satisfactory then basic performance can be obtained and the basic performance data charts are applicable.

If the engine health check is not satisfactory then either clean the filter and recheck the engine health using the basic Engine Power Check chart or manually recheck the engine health using the Sand Filter Engine Power Check chart located in the Sand Filter supplement.

If the filter was cleaned and the EPC recheck is satisfactory then basic performance can be obtained and the basic performance data charts are applicable.

If the engine was checked manually using the Sand Filter charts and found to be satisfactory, then Sand Filter Performance can be achieved. If the engine health check is still not satisfactory then contact maintenance for trouble-shooting.

NOTE

With the Vehicle Engine Management Display (VEMD) programmed for a Basic Inlet: if the engine health check is unsatisfactory for Basic Inlet EPC and the Sand Filter performance data is to be used, (located in the Sand Filter Supplement), the performance requirements must then be determined manually.

For All EC130B4 and AS350B3 with Dual Hydraulics (with VEMD Programmed for Sand Filter) – Excluding Helicopters with Arriel 2D Engines

If the engine is checked using the Sand Filter charts and EPC was found to be satisfactory Sand Filter performance can be obtained and the Sand Filter performance data charts are applicable.

If the engine health check is not satisfactory then clean the filter and recheck the engine health using the Sand Engine Power Check chart or manually recheck the engine using the Sand Filter charts. If the engine still is not satisfactory, then contact maintenance for trouble-shooting.

PERFORMANCE (cont.)

For EC130T2 with Arriel 2D Engine Only

When the Inlet Barrier Filter (IBF) system STC is installed, the VEMD is programmed for Basic Inlet.

After performing an EPC, correct the results on VEMD:

- Add 4% on TRQ MARGIN / N1 displayed: Engine Health / N1 = TRQ MARGIN / N1 + 4
- Remove 2% of TRQ MARGIN / TOT displayed: Engine Health / TOT = TRQ MARGIN / TOT - 2

If the Engine Health obtained are satisfactory (>=0), then:

- The engine health is ensured.
- The Hover performances are decreased and the basic Hover performance charts have to be considered with application of the following penalties:

  - HIGE 5ft:
    - Zp > 5000ft: remove 25 kg
    - Zp ≤ 5000ft: no penalty
  - HOGE:
    - Zp > 3000ft: remove 30 kg
    - Zp ≤ 3000ft: no penalty
  - HOGE with external load:
    - Remove 35 kg

- The Basic Rate of Climb performance is decreased. Remove 290 ft/min to the Basic Rate of Climb performance charts result.

If one of the Engine Health is not satisfactory (<0), then clean the filter and recheck the engine health following the above procedure.

If the cleaning of the filter is not possible, and Engine Health is not satisfactory, then check the maintenance aid indicator:

- If indicator >= 6 then:

  - Add 6% on TRQ MARGIN / N1 displayed: Engine Health / N1 = TRQ MARGIN / N1 + 6
  - No correction of TRQ MARGIN / TOT displayed: Engine Health / TOT = TRQ MARGIN / TOT

- If indicator >= 10 then:

  - Add 9% on TRQ MARGIN / N1 displayed: Engine Health / N1 = TRQ MARGIN / N1 + 9
  - Add 3% on TRQ MARGIN / TOT displayed: Engine Health / TOT = TRQ MARGIN / TOT + 3

If the Engine Health is still not satisfactory then contact maintenance for troubleshooting.

PERFORMANCE (cont.)

For AS350B3 with Arriel 2D Engine Only – Including Helicopters with VEMD Power Increase "H125 Power" (MOD EC07.5102)

When the Inlet Barrier Filter (IBF) system STC is installed, the VEMD is programmed for Basic Inlet.

After performing an EPC, correct the results on VEMD:

- Add 3% on TRQ MARGIN / N1 displayed: Engine Health / N1 = TRQ MARGIN / N1 + 3
- Remove 3% of TRQ MARGIN / TOT displayed: Engine Health / TOT = TRQ MARGIN / TOT - 3

If the Engine Health obtained are satisfactory (>=0), then:

- The engine health is ensured.
- The Hover basic performances are ensured and the basic Hover performance data charts are applicable.
- The Basic Rate of Climb performance is decreased. Remove 140 ft/min to the Basic Rate of Climb performance charts result.

If one of the Engine Health is not satisfactory (<0), then clean the filter and recheck the engine health following the above procedure.

If the cleaning of the filter is not possible, and Engine Health is not satisfactory, then check the maintenance aid indicator:

- If indicator >= 6 then:
  - Add 4% on TRQ MARGIN / N1 displayed: Engine Health / N1 = TRQ MARGIN / N1 + 4
  - No correction of TRQ MARGIN / TOT displayed: Engine Health / TOT = TRQ MARGIN / TOT
- If indicator >= 10 then:
  - Add 5% on TRQ MARGIN / N1 displayed: Engine Health / N1 = TRQ MARGIN / N1 + 5
  - Add 2% on TRQ MARGIN / TOT displayed: Engine Health / TOT = TRQ MARGIN / TOT + 2

If the Engine Health is still not satisfactory then contact maintenance for troubleshooting.

PERFORMANCE (cont.)

For All Aircraft

CAUTION

Helicopter performance is reduced as the IBF becomes contaminated with dirt, dust and debris. The pilot/operator is responsible to utilize the Engine Power Check (EPC) to determine if the engine can produce installed power. If engine does not pass EPC, published performance cannot be achieved. The frequency at which EPCs are conducted is up to the discretion of the operator based on the operating environment, (i.e. temperature, altitude, airborne contaminate) and the requirements of the Flight Manual or applicable Flight Manual Supplement. Contact maintenance for appropriate trouble shooting procedures as outlined in applicable Instructions for Continued Airworthiness or Maintenance Manuals. Ensure that the IBF FILTER caution lights are not illuminated during performance of the EPC.

Section 6

WEIGHT AND BALANCE

No Change