

# Donaldson Bell 407/GX IBF

*August 1, 2020*

# BELL 407/GX

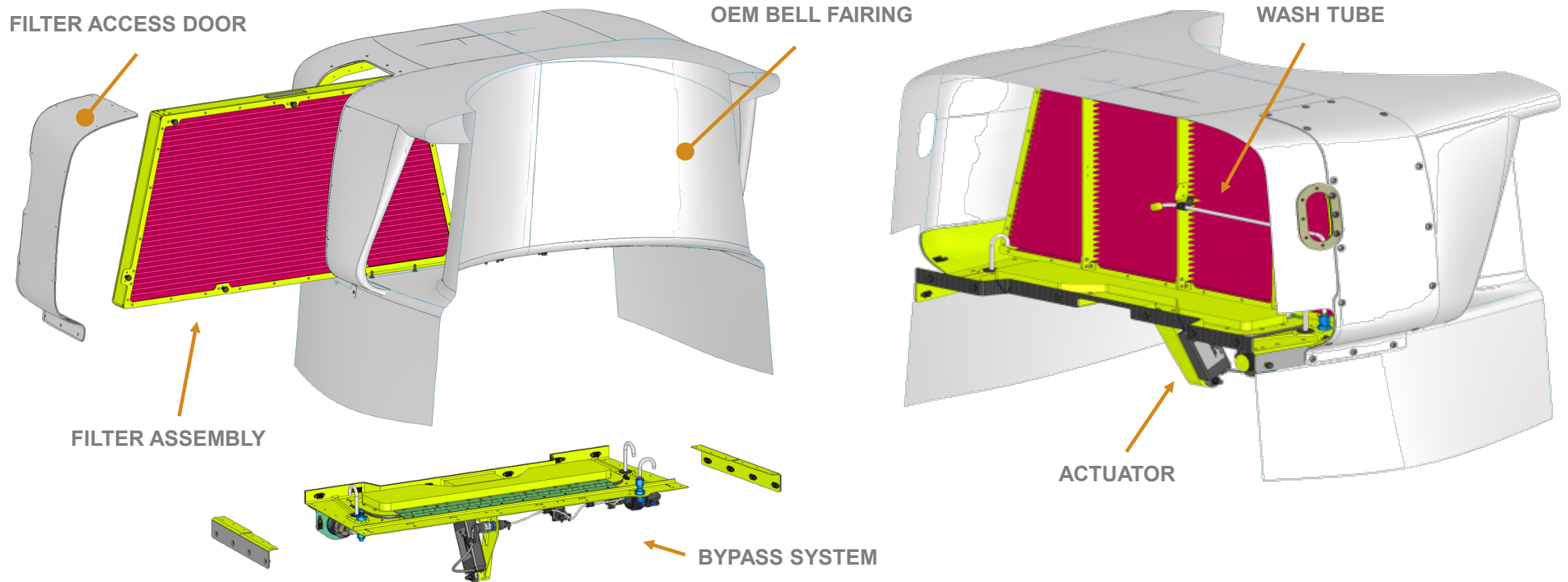




# BELL 407 IBF SYSTEM DESIGN

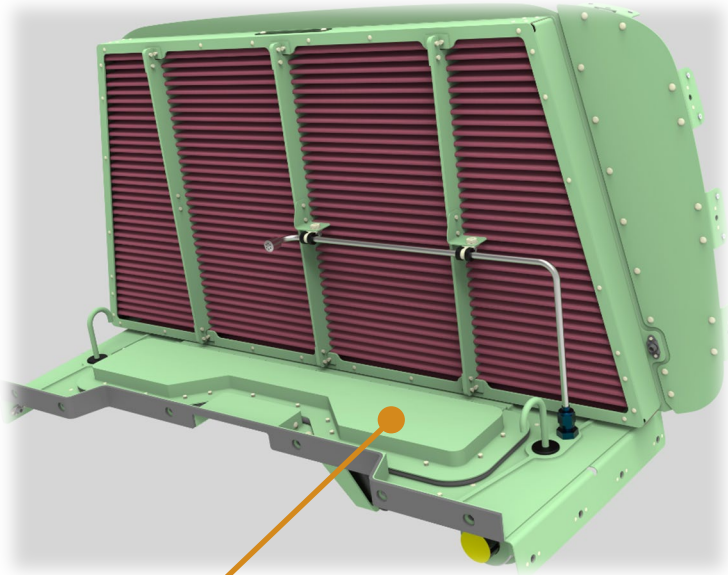


# BELL 407 IBF SYSTEM DETAILS



SHOWN INSTALLED INTO BELL FAIRING, LOOKING AFT. IBF UTILIZES EAPS MOUNTING PROVISION.

# BELL 407 IBF FILTER BYPASS SYSTEM



BYPASS DOOR



Pilot commands the bypass door to open to increase engine airflow until clear of debris conditions.

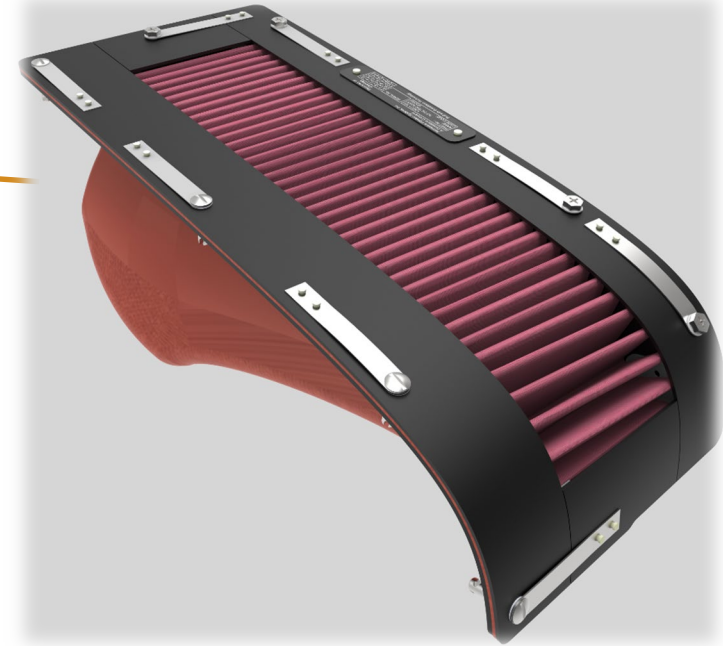
**NOTE:** Aircraft with particle separators must land immediately during heavy debris conditions and do not have the ability to keep flying like aircraft with a barrier filter bypass system.



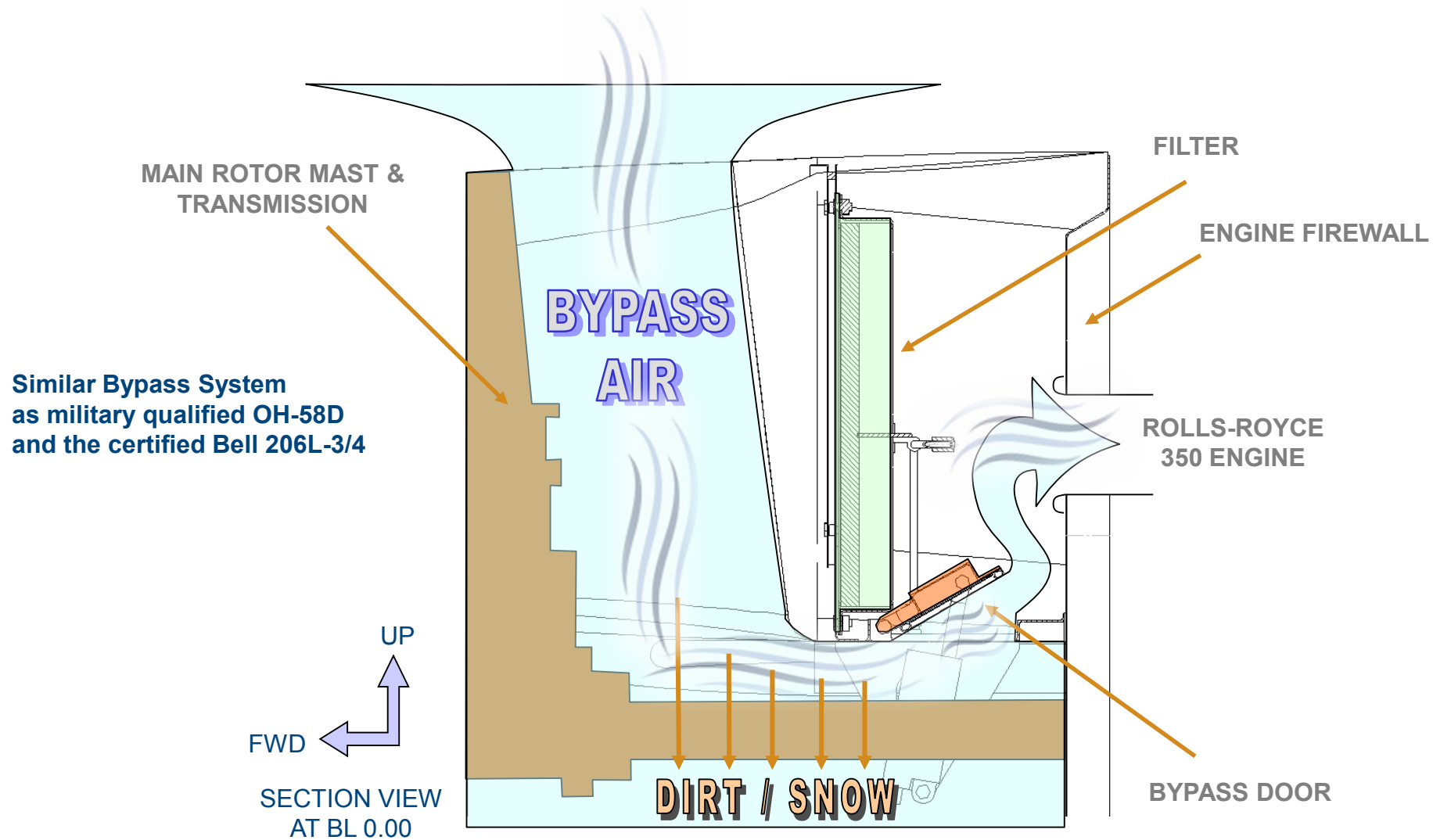
# BELL 407 IVF FILTER



The IVF filter was developed to prevent corrosion ....



# BELL 407 FILTER BYPASS AIR FLOW



# IBF FILTER MAINTENANCE AID (FMA)

- Pre and Post flight indication of filter contamination level and maximum pressure drop.
- Allows flexibility for mission planning with predictable service cycles, particularly in high tempo desert environments.
- Verification of post cleaning effectiveness





# IBF FILTER MAINTENANCE AID (FMA)

- Provides the ability to meet Condition-Based Maintenance (CBM) between established cleaning intervals, eliminating unnecessary service.
- Measures plenum pressure versus ambient, across the filter system.
- Similar FMA used on other Donaldson IBFs for the Bell 205A, 206B, 206L-1/3/4, 430, Leonardo A119, AW139, AW189, Airbus AS350, EC130, and MD Helicopters MD500.



# IBF BENEFITS: PERFORMANCE

## MAXIMUM ENGINE DEBRIS/FOD PROTECTION

Allows consistent flight operations and extends engine time on wing. Improved protection over an inertial design and significantly better protection than a FOD screen.

## IMPROVED AIRFLOW

Pleated barrier filter element provides improved air flow versus inertial separation vortex/swirl tubes typical with IPS/EAPS.



# IBF BENEFITS: VALUE

## RETURN ON INVESTMENT (ROI)

- Less premature engine removals, meet the expected engine TBO
- Long-life 4,500 flight hour filter assemblies (15 cleanings; 300-hour intervals)
- Reduction in corrosive salt air entering engine
- Engine overhaul cost reduction due to elimination of erosion and contamination on all rotating and pneumatic components
- Reduced maintenance time with improved plenum access.
- Common Line Replaceable Units (LRU) for mixed IBF fleets.
- Bleed air system maintenance eliminated with IBF





# IBF OPERATIONAL CONSIDERATIONS

- Approved for installation on both aluminum and composite cowls.
- Improved power margin for high/hot operations and confined landing zones. Filter sized for Bell 407 engine airflow.
- Engine performance retention after barrier filter installation.
- Inlet air bypass system backup not available with EAPS; added safety feature.
- Certified for flight in falling and blowing snow IAW helicopter manufacturers flight manual requirements.
- Common components with Donaldson IBF systems for Bell 407, 206L-3/4, 206L-1/C30.
- IBF is approximately 2 lbs. lighter than EAPS.
- Approved for flight to basic inlet charts and compatible with BHT-407-FMS-8.



# IBF COMPARATIVE BENEFITS

- Engine Air Particle Separators (EAPS) utilize traditional inertial particle separation technology. Barrier Filters (BF) use current technology and state of the art integration.
- BF does not require the use of engine bleed air. EAPS does require engine bleed air which reduces engine power available.
- Engine bleed air system maintenance is eliminated. Reduced chance of engine stall from leaking valves and lines.
- Inertial separation vortex/swirl tubes routinely become clogged with straw, leaves and bugs degrading performance; Barrier filter immune to this type debris clogging and operates without degradation.



# IBF COMPARATIVE BENEFITS

- Barrier Filters (BF) have significantly higher separation efficiency than inertial separators. BF typically >99% capture efficient on ISO Coarse & Fine dust, inertial separator typically <96% capture efficiency on ISO Coarse dust and far less on ISO Fine dust.
- BF are effective regardless of engine power setting; inertial separators (PS) are only effective when they have adequate engine bleed air; PS adequacy typically available above flight idle power setting.
- Significant decrease in fine sand ingestion reduces engine erosion damage from offsite landings/unprepared sites; BF virtually eliminate concern about ramp FOD ingestion





# Thank You

Donaldson Company, Inc.  
Aerospace & Defense Group

[www.DonaldsonAerospace-Defense.com](http://www.DonaldsonAerospace-Defense.com)

North America +1-877-314-9640  
[aerospace.americas@donaldson.com](mailto:aerospace.americas@donaldson.com)  
Europe +33 1 30866698  
[aerospace.emea@donaldson.com](mailto:aerospace.emea@donaldson.com)



**Donaldson.**  
FILTRATION SOLUTIONS  
AEROSPACE & DEFENSE