TECHNICAL ISSUES

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TECHNICAL Issues

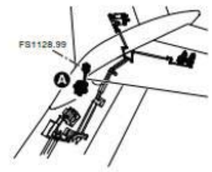
- MONITORING ITEMS
  - HSTA JACKSCREW SPALLING

- FUEL SMELL BRIEFLY IN THE COCKPIT & CABIN
- APU EXHAUST DUCT SUPPORT CRACKING
- AVIONICS RACK DECOMPRESSION PANELS
- RUDDER QUADRANT TORQUE BOX ASSEMBLY
- PERFORMANCE OPTIMIZATION DATA
- DU-875 – FDR PARAMETERS
- DU-875 – NIGHT MODE
- FAN FILTER REPLACEMENT
- YD1 (2) FAIL, AFCS 1 (2), FAIL WHEN YOU EXIT CAIMS
- EVS to GROUND –GVFD
- RNP AR- GVFD
- LP APPROACH –GVFD
- EVS to GROUND – PRIMUS 2000
- RNP AR – PRIMUS 2000
- LP APPROACH – PRIMUS 2000
- HONEYWELL AVIONICS UPGRADE
- ECL USER INTERFACE

BOMBARDIER

S-29

ACTION PLACED IN MONITORING



27-25-M-813 – **HSTA JACKSCREW SPALLING**

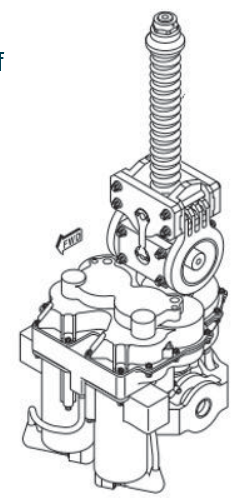
Put in monitoring in April 2015 pending the validation of the benefits of Aeroshell 64 via sampling program.

The inspection validation program is completed.

Bombardier has witnessed three (3) HSTA greasing tasks at an interval of 500H on the same aircraft using the Aeroshell 64 grease and the revised procedure (AMM Task: 12−22−00−640−812).

- No damage or spalling was observed.

Engineering concluded that the Aeroshell 64 combined with the revised greasing procedure is adequate to prevent spalling.



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49-35-M-1000

FUEL SMELL BRIEFLY IN THE COCKPIT & CABIN

After landing, as the APU is started and comes up to speed, there is a fuel smell briefly in the cockpit & cabin. In certain instances, several fuel control units were replaced with varying results, but with no definite resolution. Other have experienced this issue, with results ranging from FCU change to a complete APU swap. Need to investigate why this is happening and what can be done to prevent this from occurring.

Five (5) in-service occurrences reported on Global Platform to Bombardier & Honeywell for this condition:

- Deeper investigation on aircraft that experienced repetitive fuel smell at APU Startup revealed fuel soaked carbon deposits on combustor liner.
  - Condition was confirmed by borescope inspection of the combustor after a long flight and no post flight APU startup.

DATE RAISED	→	RAISED BY	→	ACTION BY
APR 17		G. DAVIES		J. SCHICK

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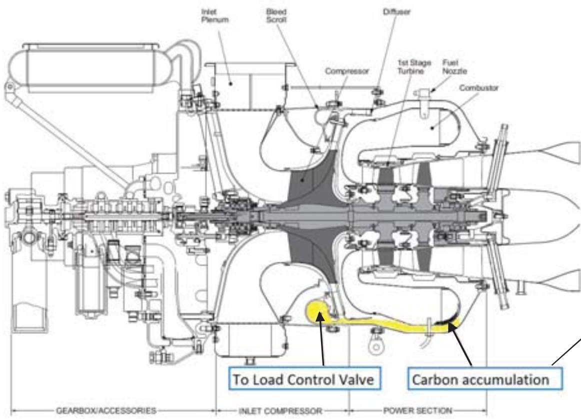
FUEL SMELL BRIEFLY IN THE COCKPIT & CABIN



Post flight borescope inspection of the APU Combustor shows carbon deposits soaked in fuel

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FUEL SMELL BRIEFLY IN THE COCKPIT & CABIN

Probable cause:

- Combination of leaking fuel nozzles and carbon build-up in the combustor.
  - The carbon originated from the combustion absorbs excess fuel during initial APU shut down which remains unburned until the next start up.
    - This results in contaminated air pushed to the ECS via the LCV causing momentary fuel smell during the post flight APU start.

Corrective Action:

- Combination of fuel nozzle replacement and complete combustor wash
  - To fully flush out the carbon, 90 liters of acetic acid solution is required
    - Ref: AMM49-21-00-170-801

Next Step:

- Troubleshooting of the last case reported to confirm effectiveness of corrective action

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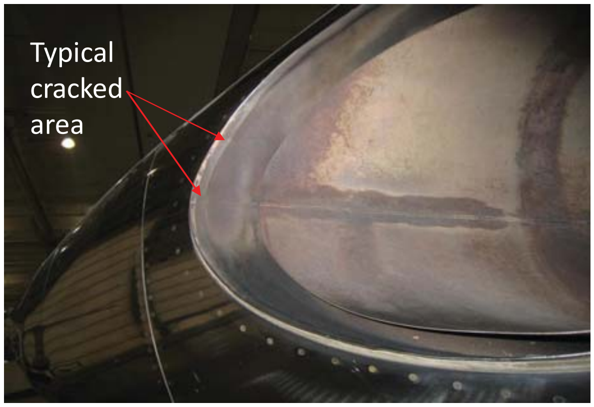
49-35-M-1006

APU EXHAUST DUCT SUPPORT CRACKING

Customers report finding a crack on the APU exhaust support duct, always in the same location. A temporary disposition involving stop drill may be allowed via SRPSA with a repeat inspection. But the support duct does require removal which involves removing the APU and the APU exhaust duct. This requires long downtime/AOG.



DATE RAISED APR 17	→	RAISED BY R. PUNCAVAGE	→	ACTION BY J. SCHICK

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49-35-M-1006

APU EXHAUST DUCT SUPPORT CRACKING

Status of the investigation:

- Repair available via : General REO 700-49-00-003 posted in 2015
  - Consists of stop drill and weld repair of the support duct.
  - Revision A issued in 2016 to allow a repair for a crack up to 6 inches long.
- In-service feedback has revealed a few instances where welded repairs have cracked post General REO incorporation
  - A cracked support duct has been retrieved from an in-service aircraft and sent to Honeywell for a complete lab analysis.
    - ✓ Aug/2017

    Initial findings:
      - No anomalies with the base material properties (spectrograph)
      - Hardness near crack was normal
      - Low Cycle Fatigue identified as the fracture mode

Next Steps:

- Review lab results and determine the potential corrective action.
  - ECD: Dec/2017

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25-34-M-984

AVIONICS RACK DECOMPRESSION PANELS

Avionics Rack Decompression Panels on the Global 5000 aircraft have no MEL relief when damaged or missing. These panels are constantly being damaged (…) Inspection/Check of these in AMM allows no damage. I would like to request that this be looked into for MEL relief.

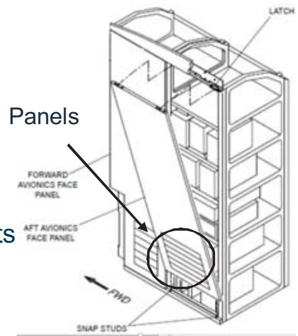
Actions Completed

Reliability Investigation

- Workmanship issues at supplier
- Vendor Service Bulletin released Jun/2017

Decompression / Smoke Detection Evaluation

- 4/6 louver panels operational meet decompression requirements



Remaining Actions

- Requirements certification
- Documentation definition (Nov/2017)
- Implementation (Target Q1/2018)

DATE RAISED	→	RAISED BY	→	ACTION BY
OCT 16		M. FISHER		J. SCHICK

53-35-M-995

RUDDER QUADRANT PROVISION ASSEMBLY

HALF RIB UPPER RUDDER QUADRANT P/N:GD417-1539-1 and P/N:GD417-1588-3 found cracked at FS1043.60

Investigation

Laboratory analysis revealed that the cracking in the two parts was caused by reverse bending fatigue crack propagations.

Actions Carried out

- Advisory Wire 700-53-0585 rev. 2 released on Feb/2017 stating no safety concern.
- Recommendation to continue with the established maintenance program (TLMC Chapter 5, task 53-ZL-00-231).
- In Service ModSum and a Generic NIEO to ease installation with VISU-LOK blind fasteners or Hi-lite fasteners.
- Creation of improved design of the Environmental Control System (ECS) rod supporting bracket and back-up plates.

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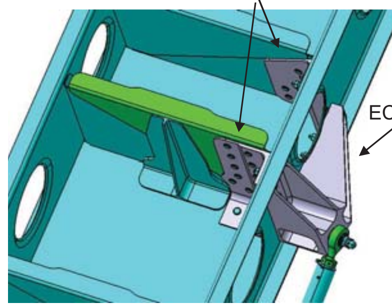
APR 17		L. NOBLE		J. SCHICK

53-35-M-995

RUDDER QUADRANT PROVISION ASSEMBLY

Remaining Actions

- Design proof, on an in-service aircraft, to confirm feasibility and required man-hours to incorporate components. ECD Q4/2017.
- Conclude evaluation of potential relief under certain conditions.
- Finalize in-service implementation plan.



DATE RAISED
APR 17

RAISED BY
L. NOBLE

ACTION BY
J. SCHICK

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00-35-F-1012

PERFORMANCE OPTIMIZATION DATA

Having the FPCCM (Flight Planning and Cruise Control Manual) more usable allowing for better optimization of the flight planning. Data more attuned to how the aircraft is actually flown
Example: No one flies this aircraft in the climb at 250KIAS above 10000’

Information received from the members was to get data for climb at 300/M.82

FPCCM will be updated to include charts for climb at 300/M.82

M.82 Cruise data has been requested and will be available at the same time

ECD: Upcoming FPCCM revision (Nov/17)

DATE RAISED
APR 17

RAISED BY
J. KASPRZAK

ACTION BY
C. WARTON

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31-35-M-997

DU-875 FDR PARAMETERS

Global 5000 (9395, 9404, 9411 and 9417) GAF with Honeywell Primus Elite DU-875 cockpit displays. Last Flight Data Recorder readout and parameter check discovered that the DU related parameters associated discrete “CheckDisplayUnit 1 to 6”, show erroneous recordings intermittently toggling between 0 and 1. All DUs are working normally and there are no flight deck effects. Recorded parameters on the FDR is required as per EASA CAT.IDE.A.190.

- Honeywell SIL D2017703000015 released Mar/17
- Bombardier notification to FAA with following recommendation May/17:

  Until such time when a fix will be available, operators who experience this issue when performing FDR download review, parameter 55 discretes for CheckDisplayUnit-X (X=1 to 6) should be ignored. All other parameter 55 status discretes are recorded correctly for each display unit.
- FAA concurrence received
- AW 700-31-0593 released Sept/17
- FDR parameter fix identified by Honeywell and will be included as part of the future DU-875 ETSO #3 software load

DATE RAISED		RAISED BY		ACTION BY
APR 17	→	A. KAUS	→	J.SCHICK

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31-35-M-1005

DU-875 NIGHT MODE

As more aircraft adopt the DU 875's crews will find that the screen brightness when viewing charts at night is too bright. Adjusting the brightness for the chart makes the nav display too dim when switching back to MFD. Honeywell recently made note of a night mode for the charts on the DU875 but it appears the night mode isn't available for the Bombardier installation. Would like to have the night mode available.

Night Mode not included in the current and next DU-875 software load for Synthetic Vision (ETSO #2,SVS).

The Night Display of Charts has been classified as a product improvement and will be included as part of the future load DU-875 ETSO #3.

DATE RAISED		RAISED BY		ACTION BY
APR 17	→	M. FAY	→	J.SCHICK

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31-33-M-976

FAN FILTER REPLACEMENT

Why are we still have to use filters and why is Bombardier even recommending to reduce the interval in case we experience blocked filter? Advisory board is asking to remove the filter. (Same as Global 7000/ 8000, C Series and supported by Rockwell Collins recommendation)

On Global 5000/6000, Fan filters were installed to prevent airborne particulates accumulating inside of the Adaptive Flight Displays (AFDs)

Advisory Committee agreed to monitor performance on C series in-service reliability of AFD with FAN Filter removed, prior to removal on filters on the Global Vision

C Series latest update:

- ✓ First 850 FH 'A' checks completed. AFDs and fans were inspected with negligible dust accumulation. No additional service data to indicate in-service issues
- C Series published an optional AMM cleaning task, with no related TLMC to drive it.

Next Steps:

Continue to monitor AFD in service performance

DATE RAISED APR 16	→	RAISED BY P. STADLER	→	ACTION BY J.SCHICK

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22-35-M-994

YD 1(2) FAIL, AFCS 1(2) FAIL WHEN EXITING CAIMS

YD 1(2) Fail, AFCS 1(2) Fail when you exit CAIMS, you could only clear the faults by cycling the IAC 1(2) Circuit Breaker. Following aircraft also experience this problem 9009, 9071, 9075, 9104, 9121, 9137. Some of these aircraft have had the problem for years. I am sure there are more if the non-vision fleet was surveyed.

- Honeywell SIL D201702000006 revision released Oct/17
  Indicating that also NVM download may cause the same issue
- AW700-45-0002 revision-16 released Oct/17; Update about HW SIL
- Forum News Article released Oct/17; Advise maintenance and flight crews about the nuisance condition
- SmartFix™ Plus released Oct/17:
  - Smartfix™ Plus Troubleshooting procedure and workaround for "YD 1/2 Fail and AFCS 1/2 Fail"
  - ATA 22 – Added reference to "YD 1/2 Fail and AFCS 1/2 Fail"
- Revise AMM TASK 22−13−00−710−801 – Operational Test of the Yaw Damper and AFCS System, Addition of note referring to potential nuisance message when CAIMS is accessed, scheduled Nov/17

This condition will be evaluated in future IAC software or hardware upgrade

DATE RAISED APR 17	→	RAISED BY B. STERN	→	ACTION BY J.SCHICK

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34-35-F-1008

EVS TO GROUND – GVFD

GVFD avionics suite/camera. Regulatory authorities are now allowing for EVS to Ground. We are looking to BBD to provide guidance for applying for the LOA, current capabilities of the platform or changes to the platform if required

Status:

- Dec/16 FAA released ruling to use EFVS for touchdown and roll out
  - FAR 91.176
  - AC 90-106A, 90-176A
- Bombardier's assessment is that the current GVFD platform has the capability to comply with ruling with potential software changes to the HUD and HDD

Next Steps:

- Bombardier and Rockwell Collins working together to develop avionics roadmap

DATE RAISED	RAISED BY	ACTION BY
APR 17	J. KASPRZAK	G. IVASCU

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34-35-F-1009

RNP AR – GVFD

Status:

- Bombardier and Rockwell Collins have evaluated this new capabilities on the GVFD:
  - RNP AR <0.3 & 0.3 for missed approach
    - Very precise approach in congested airspace, around noise sensitive areas, or through difficult terrain

Next Steps:

- Bombardier and Rockwell Collins working together to develop avionics roadmap

DATE RAISED	RAISED BY	ACTION BY
APR 17	J. KASPRZAK	G. IVASCU

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34-35-F-1013

LP APPROACH – GVFD

Status:

- Bombardier and Rockwell Collins have evaluated this new capabilities on the GVFD:
    - Approaches published when obstacles, terrain or infrastructure limitations prevented airport to meet LPV design requirements
    - Enables access to more airport (627 approaches in 470 airport in the US)

Next Steps:

- Bombardier and Rockwell Collins working together to develop avionics roadmap

DATE RAISED	RAISED BY	ACTION BY
APR 17	J. KASPRZAK	G. IVASCU

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34-35-F-1014

EVS TO GROUND - PRIMUS 2000

Honeywell avionics suite/camera. Regulatory authorities are now allowing for EVS to Ground. We are looking to BBD to provide guidance for applying for the LOA, current capabilities of the platform or changes to the platform if required

Bombardier is investigating the technical & commercial implications for viable business case

- EFVS II design requirements may impact software:
    - Must meet Design Assurance Level (DAL) B, existing EVS system is DAL C.
    - Runway Visual Range (RVR) of 1000 feet must meet "hazardous/DAL B".
    - Head Down Display (HDD) must have pilot monitoring (PM) field of vision (FOV)
        - Flight Management System Control Display Unit (FMS CDU) #2 is outside PM FOV
        - Potential IAC software change to allow displaying data on the MFD Display Unit (DU)
        - Installation of new DU-875 via the Primus Elite STC
    - EFVS system must be evaluated for System/LRUs impact
        - Heads Up Display System
        - EFVS Camera,
        - Interface with Honeywell Avionics Suite
- Evaluate operational requirement impact in terms of cost to maintain

DATE RAISED	RAISED BY	ACTION BY
APR 17	J. KASPRZAK	J.SCHICK

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34-35-F-1015

RNP AR – PRIMUS 2000

- **RNP AR (Required Navigation Performance with Authorization Required)**
  - RNP AR 0.3 / Missed Approaches 1 NM as a minimum

Bombardier is investigating the technical & commercial implications (Estimate technical, cost, business case) to establish a viable business case - either now or at a later date.

Honeywell was contacted for initial assessment of technical feasibility with the Primus 2000XP avionics system and FMS NZ6.1 software version

Federal Aviation Agency (FAA) Advisory Circular (AC) 90-101A - Approval Guidance for RNP AR Procedure

Detailed analysis of FAA, EASA and TCCA latest requirements need to be completed

- Systems/LRUs potentially affected:
  - IAC
  - HFDC
  - GNSSU
  - Autopilot and Flight Control (flight test evaluation on system performance to support the RNP values)
  - FMS Navigation database
- Evaluate operational requirement impact in terms of cost to maintain

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APR 17	→	J. KASPRZAK	→	J.SCHICK

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34-35-F-1016

LP APPROACH - PRIMUS 2000

LP Approach (Localizer Performance Approach without Vertical Guidance)

Federal Aviation Agency (FAA) Advisory Circular (AC) 90-107 - Guidance for Localizer Performance with Vertical Guidance and Localizer Performance without Vertical Guidance Approach Operations in the U.S. National Airspace System

Bombardier is investigating the technical & commercial implications to establish a viable business case - either now or at a later date

Honeywell was contacted for initial assessment of technical feasibility with the Primus 2000XP avionics system and FMS NZ6.1 software version

Detailed analysis of FAA, EASA and TCCA latest requirements need to be completed

- Systems/LRUs potentially affected:
  - IAC
  - HFDC
  - GNSSU
- Evaluate operational requirement impact in terms of cost to maintain

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APR 17	→	J. KASPRZAK	→	J.SCHICK

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00-35-F-1010

HONEYWELL PRIMUS 2000 AVIONIC SUITE UPDATE

Honeywell avionics upgrade: RNP AR, LP, Link 2000+, FANS FAA CPDLC VDL M2, SVS, etc. as shown on roadmap

Propose to close this action

Continue to present avionics upgrades information under the existing S09 Recurrent Issues for Global Express & Vision Roadmap

Presentation specific to the Honeywell Avionics Update will be held by the Aftermarket Sales & Commercial Strategy Team at the 3rd day session

DATE RAISED	→	RAISED BY	→	ACTION BY
APR 17		J. KASPRZAK		S. JOHNSON

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00-35-F-1011

ECL USER INTERFACE

RCCT User Guide:

- Elaborate on the ECL Customization Process
- Improve Procedure to Export ECL Datasets
- Provide User guide revision summary

Status: Rockwell Collins plans to review comments for improvements ECD 2018

Training

- Adding a section to the training to Load ECL Datasets, based on AMM task
- Add section about User Defined Checklist
- Provide more interactive training of customized checklist
- Add Section on Hints & Tips into On-Line Training
- ECD for release of training module April, 2018

RCCT SW Improvements Features:

- ✓ Progress Indicator (Function exist already as F12)
- Means to return to Custom Checklist following a higher priority interruption
- Copy and Paste Feature to be proposed
- Improve Graphical User Interface (GUI)
- Provide detailed release notes post RCCT SW Improvements when applicable

Status: Currently Rockwell Collins have no plan to update RCCT

Additional RCCT License for office use

Status: Additional licenses can be ordered from Rockwell Collins at additional cost

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APR 17		J. KASPRZAK		J.SCHICK

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