Customer Services

Advisory Wire

REFERENCE NO:	AW700-49-0546, Rev 01	INFORMATION TYPE:	Maintenance Operational
ATA:	49-00	EFFECTIVITY:	Global Express / XRS (9002 - 9312, 9314 - 9380, 9384 - 9429) Global 5000 (9127 to 9383, 9389 to 9400, 9404 to 9431 and 9998)
SUBJECT:	**Dashing indication with the use of MOBIL 254 oil**		

1. REFERENCES:

1.1. Honeywell (HW) Service Information Letter (SIL) NO.APU-86 –Rev 1 October 13, 2016

1.2. Flight Crew Operating Manual (FCOM) Section 04-10-2

1.3. Aircraft maintenance manual (AMM) Quantity check of the Oil supply in the APU Task 12-14-09-610-801.

INTRODUCTION:

This AW is to provide an update to the Operators regarding the APU oil dashing indication with the use of Mobil 254. This does not occur on the Global Vision aircraft as there is a different logic to display the oil quantity.

This revision is to update the Honeywell SIL (Ref 1.1) and add the AMM task (ref 1.3).

2. DESCRIPTION:

As communicated by Honeywell via the SIL (reference 1.1) an in-compatibility was discovered between the possible values the oil quantity sensor can produce and the Built-In-Test Equipment (BITE) limit set in the Full-Authority Digital Engine-Controller (FADEC) software. When the sensor value is outside the range specified in the FADEC software, a “data invalid” message will be transmitted via ARINC. A “data invalid” indication does not prevent oil refill. It will result in “amber dashes” displayed. The probability of this occurring is dependent upon oil sensor hardware variation, oil type variation and oil temperature variation which affect the oil dielectric constant.

The use of Mobil 254 oil and Mobil Jet II (MJ II) is more susceptible than any other oil to cause dashing indication in the cockpit because of the BITE limit (validity of the SSM) set in the FADEC software and the capacitance of the oil level sensor that is affected by the oil dielectric constant. When the capacitance is below 60pF, the FADEC will send a No Computed Data (NCD) to the avionics suite. This NCD condition results in an invalid SSM on Label 177 (Oil level indication) of the FADEC and causes an amber dashing indication in the cockpit (see Figure 1).

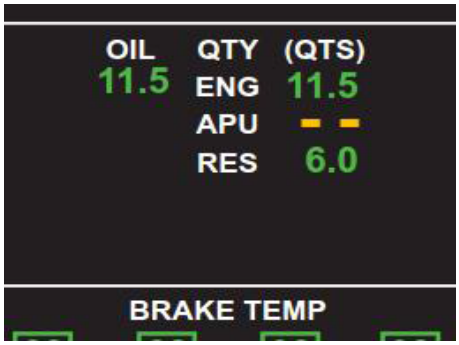

Figure 1

This condition may occur on the Global Classic aircraft as Honeywell's Avionics suite is using the APU FADEC Label 177 in combination with this Label's validity.

However, on the Global 6000 & Global 5000 featuring Vision flight deck aircraft, Rockwell Collins has implemented a different logic for displaying the oil quantity, which does not use the validity of Label 177. Instead, it uses Label 365, maintenance label associated with various faults of the Oil level probe, to display a value in the cockpit that will adjust itself during the APU oil cool down period.

During testing of the new Batch 3.2 software, the new logic for the interpretation of label 177 from the FADEC was found to be ineffective. Aircraft testing revealed that the SSM bits ignored by the IAC resulted in a green indication with "0" value when the NCD signal from the FADEC was simulated. This behavior was deemed non certifiable and therefore Bombardier and Honeywell agreed to revert to the previous logic for APU Oil Quantity indication.
Despite the fact that MOBIL 254 and MJ II oils are more susceptible to cause dashing indication, Operators using more common oil such as EXXON 2380 could also experience the issue, albeit less frequently. Figure 2 shows the fleet exposure to this condition in correlation with the different oil temperatures.

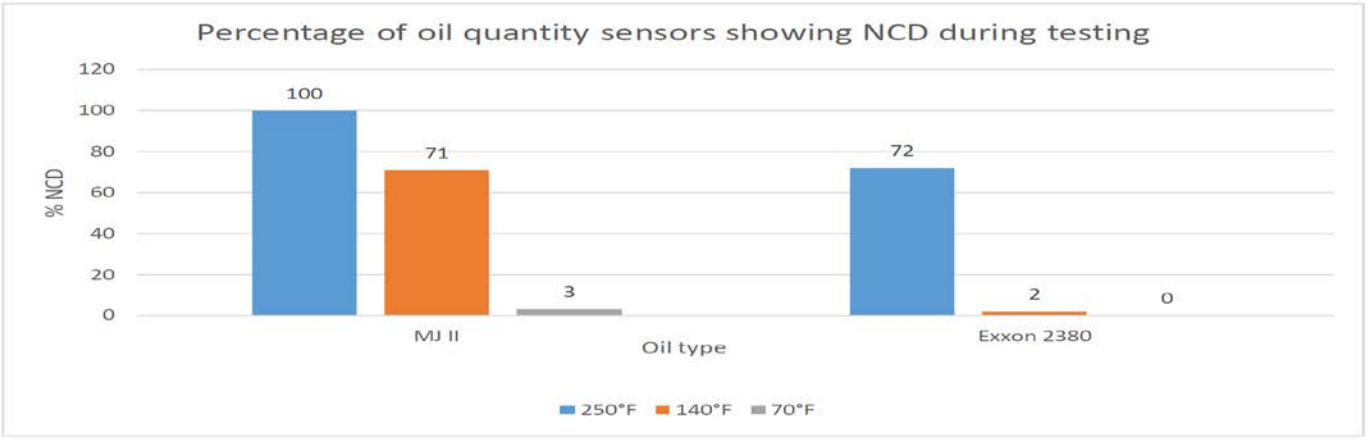

Figure 2

3. ACTION:

Currently, the oil quantity can be read through CAIMS at all times as CAIMS does not consider the validity of the label sent by the FADEC. However, for more precise reading and as mentioned in Vendor's SIL (reference 1.1), FCOM (reference 1.2) and AMM (reference 1.3), delay of 15 minutes should be allowed for the oil to settle and resume to a normal oil level indication. Oil quantity can also be read physically through the APU gravity oil servicing cap.

Should you have any technical queries pertaining to this Advisory Wire, please contact your local Field Service Representative (FSR) or Customer Response Center (CRC).