Federal Aviation Administration

Memorandum

Date: [illegible]

To: Wayne Pollack, NTSB-LAX

From: John Eller, SDL-FSDO

Prepared by: John Eller (480-419-0330, Ext 243)

Subject: Honeywell Fuel Shut-Off Valve, Part No. 394230-91, Serial No. 10514

REF: NTSB No. LAX07TA208, N92043, MFG: WSK PZL MIELEC, MODEL: M-18A, SERIAL No. 1Z026-01

On November 5, 2007, this writer convened with Marlin Kruse, Honeywell Product Integrity Engineer, at the Honeywell/Phoenix facility to disassemble, inspect, and photo-document the subject fuel shut-off valve.

Removal of the lower half of the subject valve's body revealed beads of moisture inside the valve body,which according to the Honeywell overhaul technician, is normally found to be dry. However, this moisture was determined to be in a "non-fuel wetted" area. A visual inspection of the phenolic valve seat appeared to be normal and undamaged. Further evaluation of the subject valve, including a dial indicator inspection of the armature rod's stroke, revealed no anomally which would cause fuel starvation.

The subject valve was then reassembled by the Honeywell overhaul technician in the "as-received" configuration and with the same parts. Marlin Kruse and this writer proceeded to hand-carry the subject valve assembly to the operational testing area for a flow check in accordance with the Honeywell Overhaul Manual No. 394230, Table No. 703/Test Data Sheet. It should be noted at this point that during the first post-accident flow check that Honeywell conducted of the subject valve, the fuel inlet fitting contained the correct restricted orifice and did not conform to the flow test data sheet regarding the "pressure drop". During the flow testing today, we removed the fuel inlet fitting with the restricted orifice and obtained the proper flow value for the "pressure drop" test (see attached Test Data Sheets). Apparently, a fuel inlet fitting with a restricted orifice is installed by Honeywell in accordance with their "Engine Model No./Engine Part No. Effectivity Code List"(see attached IPC sheets), after the fuel shut-off valve assembly, whether new or overhauled, is flow checked.

In summary, the consensus of this evaluation team is that the subject fuel shut-off valve exhibited no internal or operational anomalies which would have caused the prime mover to prematurely shut-down in flight. Should you have further questions regarding the above evaluation, please contact myself or Marlin Kruse directly at 602-365-7411.

CAUTION: PARTS MANUFACTURED UNDER LICENSE BY HINDUSTAN AERONAUTICS, LIMITED OF INDIA (HAL) ARE IDENTIFIED BY AN "H" IN FRONT OF THE HONEYWELL PART NUMBER. SUCH PARTS ARE NOT BUILT UNDER AN FAA-APPROVED PRODUCTION QUALITY SYSTEM, AND THEREFORE ARE NOT APPROVED FOR INSTALLATION IN FAA TYPE CERTIFICATED ENGINES.

Table 1. Effectivity Code List

Engine Model No.	Engine Part No.	Effectivity Code
TPE331-11U-601G	3102540-1	AA
TPE331-11U-602G	3102540-2	BA
TPE331-11U-611G	3102540-3	CA
TPE331-11U-612G	3102540-4	DA
TPE331-11U-601G	3102540-5	EA
TPE331-11U-611G	3102540-6	FA
TPE331-11U-611G	3102540-7	GA
TPE331-11U-612G	3102540-8	HA
TPE331-11U-601G	3102540-9	IA
TPE331-11U-611G	3102540-10	JA
TPE331-11U-612G	3102540-11	KA

NOTE: A description for the use of these code symbols may be found in Paragraph 2.C., Explanation of Terms and Symbols.

FIG. ITEM	PART NUMBER	AIRLINE STOCK NO.	1 2 3 4 5 6 7 NOMENCLATURE	EFFECT (USE) CODE	UNITS PER ASSY	
2						
- 1	NONPROC731001A		PLUMBING INSTL-FUEL SHUTOFF VALVE AND FUEL CONTROL AND PUMP ASSY (SEE FIG. 1, 72-00-00 FOR NHA)		1	
5	3102819-1		.TUBE ASSY		1	
- 7	651-525-9004		.SEAL (MAINT/REPAIR USE ONLY)		2	
10	S9412-554		.PACKING		1	
- 10A	M25988-2-904		.PACKING (ALTN PART FOR ITEM 10)		1	
15	AN815-4J		.UNION		1	
30	723-510-9173		.TEE		1	
35	MS21043-3		.NUT		1	
40	MS9489-05		.BOLT		1	
45	211-501-9112		.CLAMP		1	
50	MS21043-3		.NUT		1	
55	S8157N281-032		.WASHER		1	
60	MS9556-16		.BOLT		1	
- 60A	MS21279-16		.BOLT (ALTN PART FOR ITEM 60) (SEE NOTE 1)		1	
65	MS9592-046		.BRACKET		1	
66	MS21043-3		.NUT		2	
67	MS9489-05		.BOLT		2	
68	211-501-9112		.CLAMP		4	
70	3102125-1		.TUBE ASSY (PRE SB 73-0189)		1	
- 70A	3102125-2		.TUBE ASSY (POST SB 73-0189)		1	
- 72	651-525-9004		.SEAL (MAINT/REPAIR USE ONLY)		2	
75	AN815-4J		.UNION	AA,BA, EA,GA, IA	1	R
→ 80	3103389-3		.FITTING-ORIFICED	CA,DA, FA,HA, JA,KA	1	
82	S9412-554		.PACKING		1	
- 82A	M25988-2-904		.PACKING (ALTN PART FOR ITEM 82)		1	

- ITEM NOT ILLUSTRATED

⊗ INITIAL POST-ACCIDENT FLOW CHK.

Table 703. Test Data Sheet

UNIT PART NUMBER: 394230-9-1 UNIT SERIAL NUMBER: 10514

AMBIENT TEMPERATURE: 73 °F (°C) BAROMETRIC PRESSURE: 28.6 IN. (MM) HG A PERCENT HUMIDITY 31 %

TEST	REQUIREMENT	ACTUAL VALUE	ACCEPT (√)
DIELECTRIC STRENGTH			
EVIDENCE OF ARCHING	NONE	N/A	
CURRENT AT 750VAC	0.5 MA MAXIMUM	N/A	
PROOF PRESSURE AND EXTERNAL LEAKAGE			
PROOF PRESSURE WITH VALVE CLOSED	NO DEFORMATION		✓
EXTERNAL LEAKAGE	50 CC EACH MINUTE MAX	0	
PROOF PRESSURE WITH VALVE OPEN	NO DEFORMATION		✓
EXTERNAL LEAKAGE (CODES AA-FA)	50 CC EACH MINUTE MAX	N/A	
PRESSURE DROP TEST			
INLET PRESSURE	173 TO 177 PSIG (1193 TO 1220 KPA)	175	
PRESSURE DROP	60 PSI (413,7 KPA) MAXIMUM	112	
FUNCTIONAL			
AUTO POSITION	300 PSIG (2068 KPA) MINIMUM	428	
OFF/AUTO POSITION	ZERO OUTLET PRESSURE		✓
MINIMUM VOLTAGE			
OPENING	10.5 VDC MAXIMUM		✓
CLOSING	17.0 VDC		✓
MANUAL CLOSING			
TO THE MANUAL OFF POSITION	7.5 TO 11.0 LB (0,8 TO 1,2 NM)	10	
TO THE AUTO POSITION	7.5 TO 11.0 LB (0,8 TO 1,2 NM)	9.5	

⊗ SUBSEQUENT (2ND) FLOW C
W/O RESTRICT
INLET FITTIN

Table 703. Test Data Sheet

5 Nov 2007

UNIT PART NUMBER: 394230-9-1 UNIT SERIAL NUMBER: 0514

AMBIENT TEMPERATURE: _____ °F (°C) BAROMETRIC PRESSURE: _____ IN. (MM) HG A PERCENT HUMIDITY _____ %

TEST	REQUIREMENT	ACTUAL VALUE	ACCEPT (√)
DIELECTRIC STRENGTH			
EVIDENCE OF ARCHING	NONE		
CURRENT AT 750VAC	0.5 MA MAXIMUM		
PROOF PRESSURE AND EXTERNAL LEAKAGE			
PROOF PRESSURE WITH VALVE CLOSED	NO DEFORMATION		
EXTERNAL LEAKAGE	50 CC EACH MINUTE MAX		
PROOF PRESSURE WITH VALVE OPEN	NO DEFORMATION		
EXTERNAL LEAKAGE (CODES AA-FA)	50 CC EACH MINUTE MAX		
PRESSURE DROP TEST			
INLET PRESSURE	173 TO 177 PSIG (1193 TO 1220 KPA)	176 (Different 174 inlet fit)	
PRESSURE DROP	60 PSI (413,7 KPA) MAXIMUM	110 (✓ 56)	
FUNCTIONAL			
AUTO POSITION	300 PSIG (2068 KPA) MINIMUM		
OFF/AUTO POSITION	ZERO OUTLET PRESSURE		
MINIMUM VOLTAGE			
OPENING	10.5 VDC MAXIMUM		
CLOSING	17.0 VDC		
MANUAL CLOSING			
TO THE MANUAL OFF POSITION	7.5 TO 11.0 LB (0,8 TO 1,2 NM)		
TO THE AUTO POSITION	7.5 TO 11.0 LB (0,8 TO 1,2 NM)		

Different inlet Fitting (two restrictions) Than one supplied