NATIONAL TRANSPORTATION SAFETY BOARD
Office of Research and Engineering
Materials Laboratory Division
Washington, D.C. 20594

January 14, 1997

METALLURGIST'S FACTUAL REPORT Report No. 97-40

A. ACCIDENT

Place	: Aliquippa, Pennsylvania
Date	: September 8, 1994
Vehicle	: Boeing 737-3B7, N513AU
NTSB No.	: DCA94-M-A076
Investigator	: Greg Phillips (AS-40)

B. COMPONENTS EXAMINED

Hydraulic Fluid Samples, acquired 9-24-96

#1 B System Pressure return elevator feel unit
#2 A System Pressure return elevator feel unit
#3 A System Filter bowl elevator actuator
#4 B System Filter bowl elevator actuator
#5 B System Filter bowl unfiltered side
#6 A System Filter bowl unfiltered side

C. DETAILS OF THE EXAMINATION

Samples #1 through #5 were received in Monsanto "Skydrol-Kit" plastic bottles. Sample #6 was contained in a small plastic bottle. All bottles were opened and tested[1] on January 7, 1997 at the J. F. Queeny Plant of Monsanto. Party representatives from Parker, Boeing and Monsanto were present throughout the testing.

A small portion of each fluid sample was taken for gas chromatography and moisture content (weight %) tests. The remaining fluid was filtered for manual particle counting with acid number (mg KOH / g) tests performed on the filtered fluid. The particle distribution on the filter for sample 1 was nonuniform across the filter precluding a valid count. The filter patches from samples 3, 4, 5, and 6 were too heavily loaded to be counted. Manual particle counting on sample 2 and visual characterizations of particles on all filters will be performed by Boeing and Parker and will be reported separately. Results for each sample are listed in the attached table.

[1] All tests were perfomed in accordance with applicable SAE, ASTM or Monsanto standards or recommended practices to the extent that sample size would allow.

Data Summary

The test results for moisture and acid number were within the in-service limits called out in the B-737 Maintenance Manual[2]. System A fluid was almost entirely made up of Skyrol fluid (94%) while system B was predominately Skydrol (77%) with a significant amount of HyJet fluid (23%) was also found.

[redacted]
Joe Epperson
Senior Metallurgist

[2] Table 601, page 603 of manual dated "Nov 15/93"

Aircraft: Boeing 737-3B7, USAir ID:N513AU

Analysis Date: 1-7-97 By: Monsanto

Sample No.	#1 (B)	#2 (A)	#3 (A)	#4 (B)	#5 (B)	#6 (A)	A avg	B avg	GLP
Appearance	Green	Green	Green	Green	Green	Black			Purple
Sample Size (ml)[3]	18	42	18	16	16	19	26.33	16.67	
Moisture % by Weight	0.80	0.50	0.42	0.66	0.67	0.43	0.45	0.71	0.13
Acid No. Mg KOH/g	0.34	0.11	0.11	0.31	0.34	0.15	0.12	0.33	0.15
GC	77	94	94	77	77	94	94	77	

[3]Measured after filtering.