Continental Motors, Inc.

Component Analysis Report

N/R = Not Reported / N/A = Not Applicable

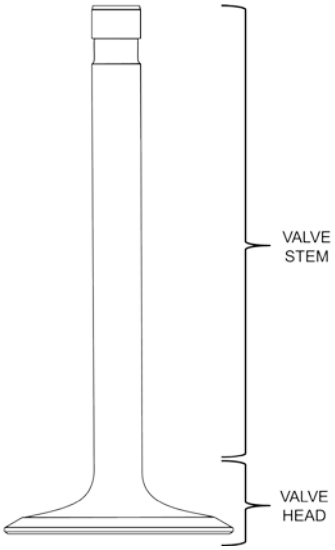
Exhibit #:	N/A			Analytical Date:	04/10/2014						
Warranty Claim #:	N/A			RMA/AV-18 #:	N/A						
Engine Model:	IO-550-B39			Engine S/N:	684677						
Component P/N:	655469B			Component S/N:	AC04AB154						
Engine:		Component:	X	New:		Rebuilt:		Overhaul:		Date:	
Aircraft Make/Model:	Beech A36			Aircraft S/N:	E-3380			Reg. #:	N999PK		
Engine Position:	Single-Engine										
Engine Build Date:	11/22/2000		Date in Service:		03/06/2001		Date Removed:		N/A		
Date of Occurrence:	05/28/2013				Engine/Component Hours:				893.2		
Inspection Performed By:	Phillip Grice, Greg Eastburn, and Nicole Charnon, with Ralph Hicks (NTSB)				Search Code:				59-01-34		

Components Returned: #5 Cylinder

Returned By: Mike Huhn

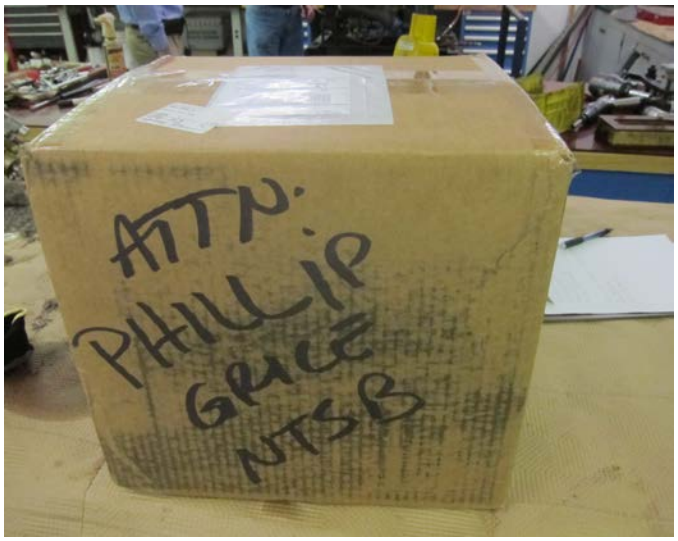
Analytical Report:

The visual examination of the cylinder revealed that the exhaust valve displayed a localized yellow-green discoloration on a 1/3rd of its circumference, indicative of a burnt valve condition. No other anomalies with the cylinder were visually noted. The dimensional examination of the cylinder revealed that the exhaust valve guide was wider than the new part limits toward the valve head (bell-mouthing). The exhaust valve stem was narrower than new part limits toward the valve head (necking). There were no anomalies noted with the valve tips or rocker faces. Some guide wear and valve necking is considered normal and the extent is usually dependent on total time and operating conditions.

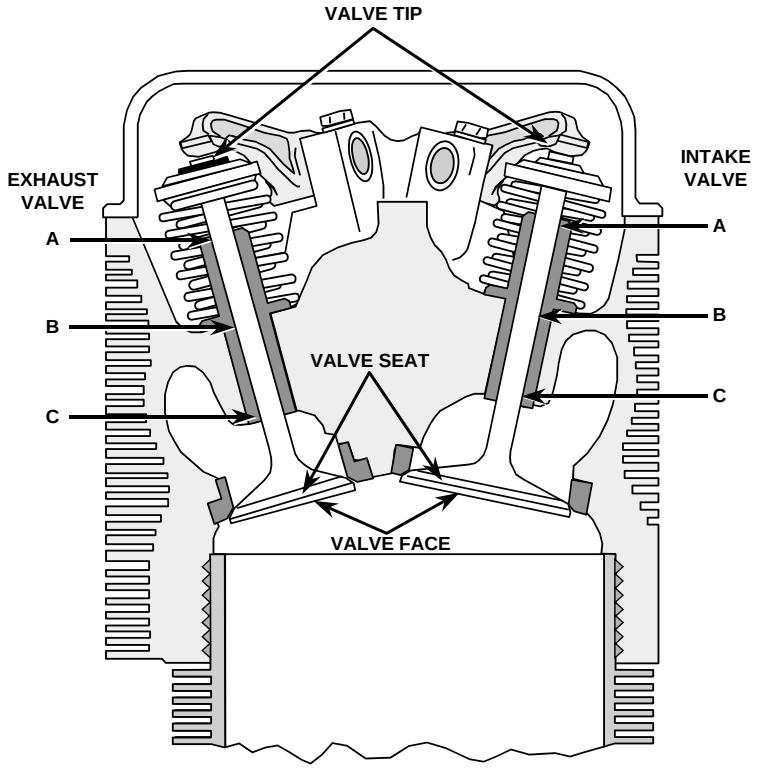


It should be noted that the engine was built in 2000 and the #5 cylinder was built in 2004. The total time listed for the engine and airframe during the last annual inspection (June 1, 2012) was 893.2 hours. However, the total time accrued on cylinder #5 is unknown, as maintenance records have not been located for the accident airplane.

The cause for exhaust valve burning could not be determined.

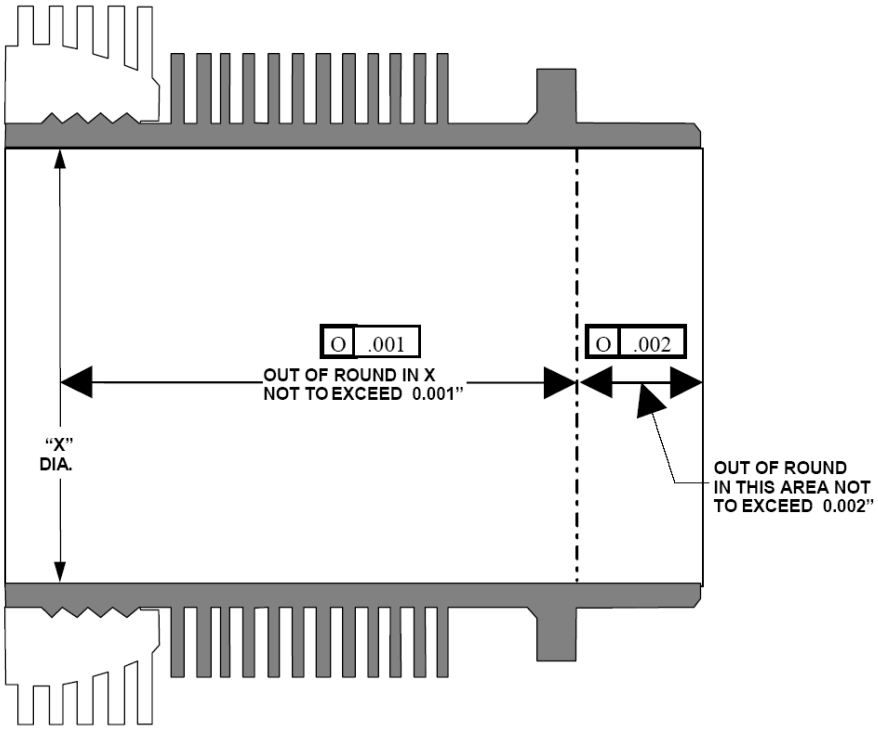

ATTN:
PHILLIP
GRICE
NTSB


28 LBS
1 OF 1
SHIP TO:
PHILLIP GRICE
CONTINENTAL MOTORS INC
2039 SOUTH BROAD STREET
MOBILE AL 36615-1286
AL 366 0-32
UPS 2ND DAY AIR
2
TRACKING #: 1Z A39 78T 02 9861 0324
BILLING: P/P
CONTINENTAL MOTORS
2039 S BROAD ST
MOBILE AL 36615-1286
P-RIDE
CPU-FL2
0324
1:100
X



Cylinder P/N:	655469B		Head Date and S/N:	1-04, AC04AB154		Position:	5
DIMENSIONAL EXAMINATION							
Component	A - 0°	A - 90°	B - 0°	B - 90°	C - 0°	C - 90°	
Intake Valve	0.4336	0.4345	0.4337	0.4336	0.4335	0.4336	
Intake Guide	0.4365	0.4350	0.4357	0.4358	0.4356	0.4358	
Exhaust Valve	0.4335	0.4334	0.4329	0.4329	0.4319	0.4314	
Exhaust Guide	0.4374	0.4374	0.4375	0.4382	0.4454	0.4434	
Intake valve stem diameter, new limits = 0.4330 - 0.4340							
Intake valve guide inside diameter, new limits = 0.4350 - 0.4362 (installed in cylinder)							
Exhaust valve stem diameter, new limits = 0.4334 - 0.4341							
Exhaust valve guide inside diameter, new limits = 0.4370 - 0.4380 (installed in cylinder)							

VISUAL EXAMINATION	
Intake Valve Tip	The intake valve tip displayed a normal circular wear pattern. Some mechanical damage was noted on the edges and was likely a result of valve removal at the salvage facility.
Intake Valve Seat	The intake valve seat displayed uniform seating signatures with a small amount of seat recession.
Intake Valve Face	The intake valve face displayed a dark sooty appearance consistent with the rest of the cylinder head and likely a result from the post-crash fire and heat damage. There were little-to-no combustion deposits on the intake valve face.
Exhaust Valve Tip	The valve tip displayed a normal circular wear pattern. Some coked oil residue was noted on the valve tip in an area in which the rocker was not touching the valve tip. No other anomalies were noted.
Exhaust Valve Seat	The exhaust valve seat displayed signs of seat recession in the area behind the discoloration. Minute cracks were also visible in the recession area.
Exhaust Valve Face	The exhaust valve face displayed a localized yellow-green discoloration over 1/3 of its outside circumference, consistent with a burned valve.



New Part Tolerances	Diameter Middle of Ring Travel	Diameter Top of Ring Travel
	5.247 - 5.250	5.244 - 5.247
Cylinder Bore Diameters – Cylinder #5		
Measurement Location	Vertical Plane - Inches	Horizontal Plane - Inches
Bottom of Ring Travel	5.2522	5.2516
Middle of Ring Travel	5.2525	5.2499
Top of Ring Travel	5.2523	5.2480