



**Teledyne Continental Motors, Inc.**  
A Teledyne Technologies Company

## ENGINE ANALYSIS REPORT


**ENGINE MODEL** IO-470-U (Left)

**ENGINE SERIAL** 115276

**AIRCRAFT MODEL** Cessna 310I

**SERIAL NUMBER** 310I0145

**REGISTRATION NUMBER** N8145M

INVESTIGATOR	SIGNATURE	DATE
FRED H. FIHE		10-7-2002



**ENGINE ANALYSIS REPORT**

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**GENERAL INFORMATION**

EXAMINATION		ACCIDENT/INCIDENT (A/I)	
Date	9-5-02	Aircraft Model	Cessna 310I
Facility	Teledyne Continental Motors	Serial Number	310I0145
Address	P.O. Box 90	Registration	N8145M
City	Mobile	Date of A/I	7-4-02
State and Zip	Alabama, 36601	A/I Location	San Dimas, CA

**ENGINE INFORMATION**

Make	TCM
Model	IO-470-U
Serial No.	115276
Total Time	Unknown
Time SOH	1050
Engine Build Date	4-21-64 (New)

**Significant Logbook Information:**

Original logbooks lost. New log indicates 1050 hour since major overhaul.

**Disposition of engine following exam:**

Engine being held pending disposition instructions.

**RECEIVING INFORMATION**

Received at:	TCM
Date Received:	9-5-02
FAA/NTSB	NTSB
Tagged:	
Box Sealed:	Yes
Receiver No.	A67641
Remarks:	



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#### ATTENDEES

<b>Name</b>	Jason Ragogna	<b>Name</b>	Fred Fihe
<b>Address</b>	NTSB, Arlington, TX	<b>Address</b>	P.O. Box 90, Mobile, AL 36601
<b>Organization</b>	NTSB	<b>Organization</b>	Teledyne Continental Motors
<b>Phone No</b>	[REDACTED]	<b>Phone No</b>	[REDACTED]
<b>Name</b>	Henry Soderlund	<b>Name</b>	W.G. Roebuck, J.M. Little
<b>Address</b>	Wichita, KS	<b>Address</b>	P.O. Box 90, Mobile, AL 36601
<b>Organization</b>	Cessna Aircraft Co.	<b>Organization</b>	Teledyne Continental Motors
<b>Phone No</b>	[REDACTED]	<b>Phone No</b>	[REDACTED]

#### REPORT SUMMARY:

This was the left engine on the above referenced aircraft.

The engine was prepared for run by replacing damaged balance tube, removing exhaust and installing short stacks and removing some baffling. The engine was placed on a test dolly and prepared for engine test.

The engine was tested on TCM production test cell number 43. The engine ran normally and was capable of developing rated power. See copy of Aircraft Engine Test Log for data taken during engine run.

After completion of the run the right engine fuel pump was installed on this engine for functional check. After recording data from this run the engine was shut down and the throttle/metering assembly and manifold valve, lines and nozzles were installed and test ran. See Aircraft Engine Test Log sheet for this recorded data.

#### EXTERNAL INSPECTION OF ENGINE

1. The induction balance tube was crushed.
2. No band clamp was on the rubber coupling below number 1 cylinder.
3. Debris, which appeared to carbon chunks, was found on the propeller governor oil screen.

### ENGINE TEARDOWN AND EXAMINATION

#### INDUCTION SYSTEM

Induction balance tube was crushed and replaced for engine run. A band clamp was missing from the induction coupling below number 1 cylinder.

#### EXHAUST SYSTEM

Exhaust system runners with engine were damaged from impact.



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### **IGNITION SYSTEM:**

#### **MAGNETOS:**

The magnetos were not removed from engine. They were tested on the engine test run and both were functional.

#### **IGNITION HARNESS:**

Harness was intact and tested on engine run.

#### **SPARK PLUGS:**

Sparkplugs were tested during engine run.

### **FUEL SYSTEM:**

#### **FUEL PUMP:**

The fuel pump exhibited a fuel stain on the rear relief valve cover. Pump was functional tested on the engine run.

#### **MANIFOLD Valve:**

No data plate was on valve. The number 631427, 2 PSI was etched on the top cover. The serial 7776 was metal stamped on the bottom of the valve. The manifold valve was functional checked on the engine run.

#### **NOZZLES:**

The nozzles were all clear and tested on the engine run.

#### **THROTTLE/METERING UNIT:**

A fuel stain was observed at the center plug retainer screw. The fuel metering unit was functional tested on the engine run.

### **CYLINDERS:**

All cylinders were chrome as indicated by an orange band around the base of each cylinder. The cylinders were functional tested on the engine run.



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**ENGINE COMPONENT LOG**

COMPONENT	MANUFACTURER	PART NUMBER	SERIAL NUMBER
Crankcase	TCM	539488/539489 casting	724
Crankshaft	Not recorded		
Cylinders	Orange band		
Left Magneto	TCM	S6RN-201	885518
Right Magneto	TCM	S6RN-201	27252R
Spark Plug	Champion	RHB32E	
Fuel Pump	TCM	638156-2	6120
Metering Unit	TCM	629904-2R	18150R
Manifold Valve	TCM	631427	7776
Nozzles	TCM	D12C	
Propeller Governor	Woodward	210444	1825090F

TYPE OF TEST ACC INVEST  
 SL RATED 260 H.P. @ 2625 RPM  
 TCM TEST-SPEC. NO. TH 3211  
 TEST STAND NO. 43 TYPE Prop  
 TEST CLUB NO. DIA. 62"  
 IGN. TIMING  
 FUEL INJECTION MISC. TCME  
 NOZZLE INDENT.

AIRCRAFT ENGINE TEST LOG

N 8145M

START DATE 9-6-07  
 SHEET 1 OF 1

TCM MODEL J04204  
 TCM SERIAL NO 115276  
 COLLAR LEAKAGE CHECK  
 TEMPERATURE  
 DIFFERENTIAL PRESSURE

ENGINE PERFORMANCE TEST  
 BOTH MAGS 2100 R.P.M.  
 R.H. 1995 L.H. 1950  
 DROP R.H. 125 L.H. 150  
 FUEL CUT OFF OK

TIME		R.P.M.		INTAKE PRESS.		OIL SYSTEM		FUEL SYSTEM				ATMOSPHERE				CYLINDER TEMP - F						
READ ING	A.M. P.M.	MIN.	DESIRED	ACTUAL	ADMP IN HG	INLET IN H2O	PRESS P.S.I.	TEMP °F	FLOW LBS/HR	NOZZLE PRESS	PUMP PRESS.	FUEL °F	ROOM °F	TURBO PRESS	MSC	CORR BARO	NO. 1	NO. 2	NO. 3	NO. 4	NO. 5	NO. 6
1		5	1200	236	16		62		23.0	2.7	16.9	86	87				238	182	225	168		
2		5	1600	158	17		58		37.9	35	19.0	86	87				290	222	272	189		
3		5	2100	2100					Magnetos Drop Check								356	344	340	284		
4		10	2100	2100	29.0		36		132.8	17.2	29.9	94	93				356	346	345	286		
5		10	2380	2380	26.0		35		100.0	16.4	30.0	94	93				356	323	334	277		
6		5	1600	712	15		20		8.4	1.6	8.9	94	93				295	267	272	284		
With Right Engine Fuel Pump																						
1		5	1200	1188	18		10		24	2.5	16.5	87	89				207	167	180	142		
2		5	2625	2608	29.0		40		130.8	16.9	29.3	96	96				356	338	337	285		
3		5	2380	2384	26.0		36		98.8	10.3	28.4	96	97				358	326	338	280		
With Right Engine Metering Unit & manifold lines & Nozzles																						
1		5	2250	2100	28.9		50		138	19.4	33	95	97				324	314	316	259		
1		5	2625	2560	28.9		33		138	19.6	33	95	97				343	340	338	274		

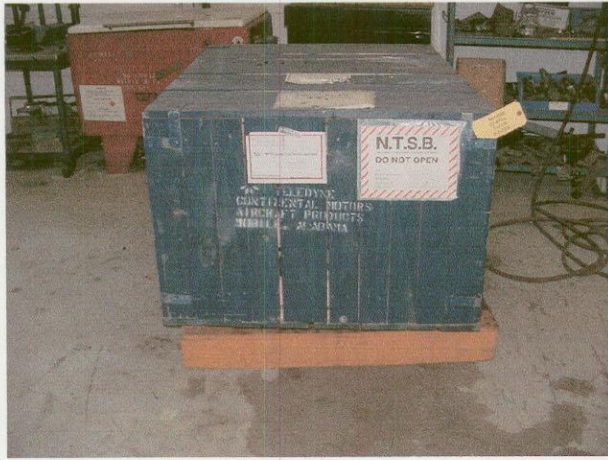
SPECIFIC OIL CON. AT \_\_\_\_\_ R.P.M. \_\_\_\_\_ LBS PER HR. \_\_\_\_\_  
 H P CORRECTED TO 29.92" HG. INLET AIR PR. & 60° F INLET TEMP. #1 \_\_\_\_\_  
 REMARKS: #2 \_\_\_\_\_  
 ACCEPTED DATE \_\_\_\_\_  
 ACCEPTED TIME \_\_\_\_\_



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PHOTO LOG N8145M  
IO-470-U SERIAL 115276 (LEFT)

1. ENGINE CRATE



2. FRONT IN CRATE



3. RIGHT SIDE



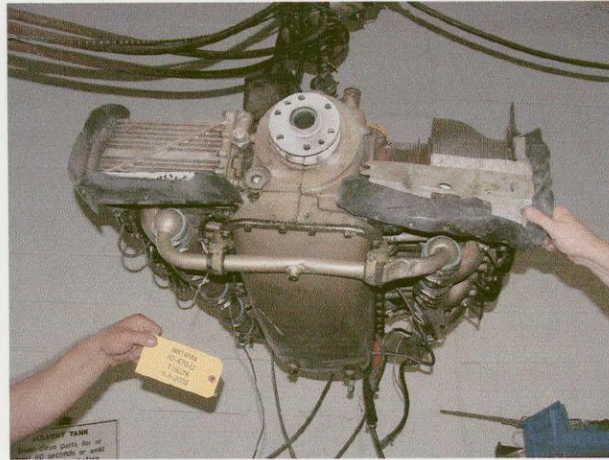
4. LEFT SIDE



5. REAR



6. FRONT UNDERSIDE

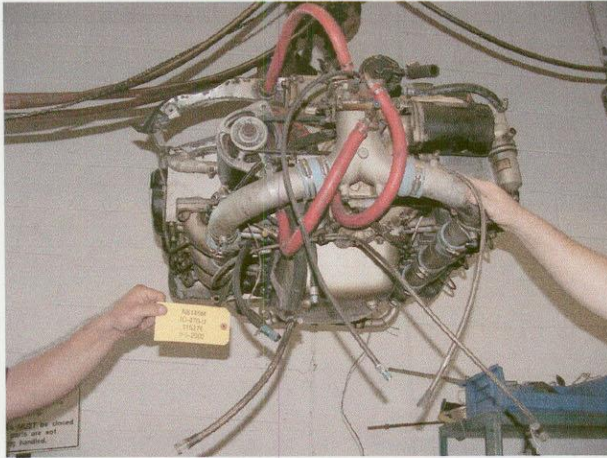




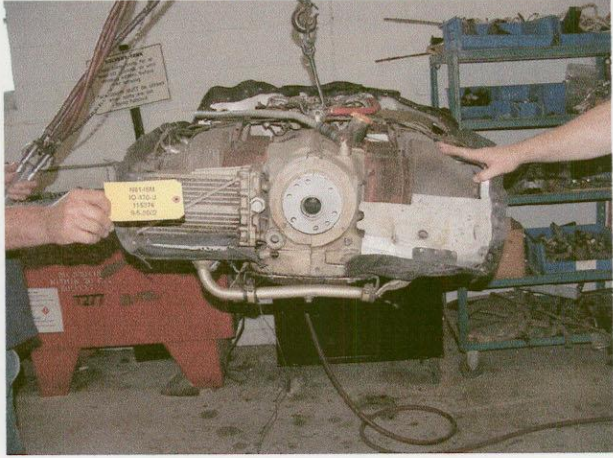
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PHOTO LOG N8145M  
IO-470-U SERIAL 115276 (LEFT)

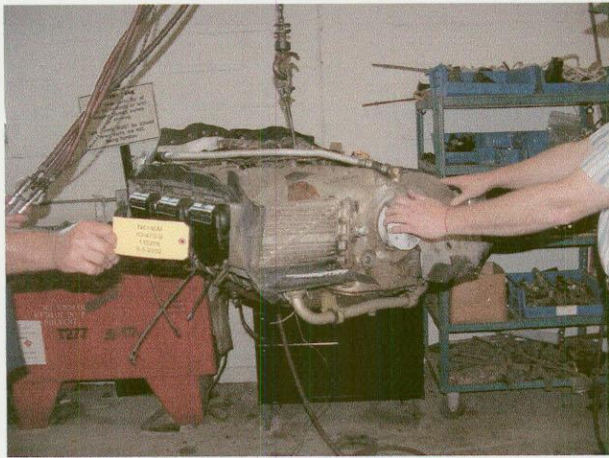
7. REAR UNDERSIDE



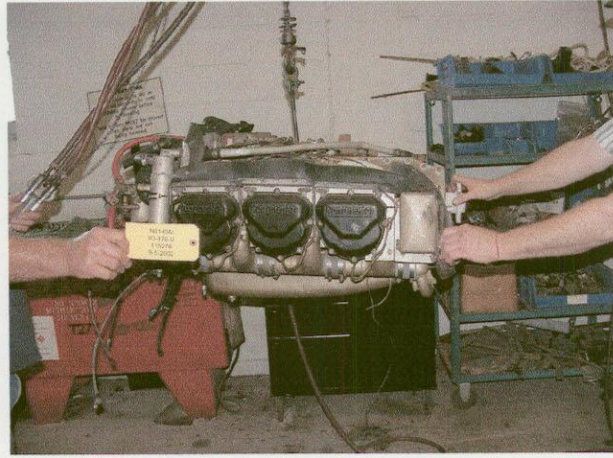
8. FRONT ON HOIST



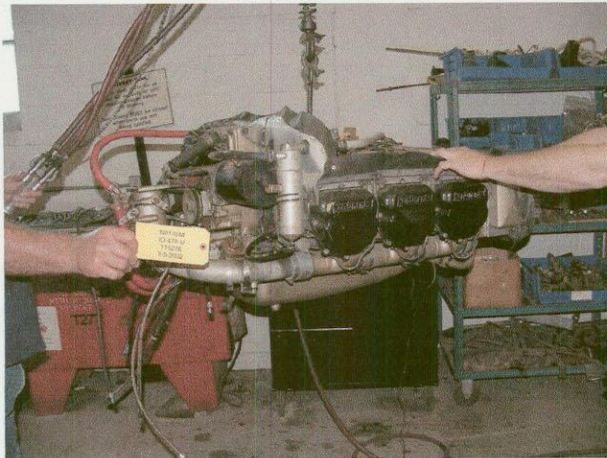
9. RIGHT FRONT



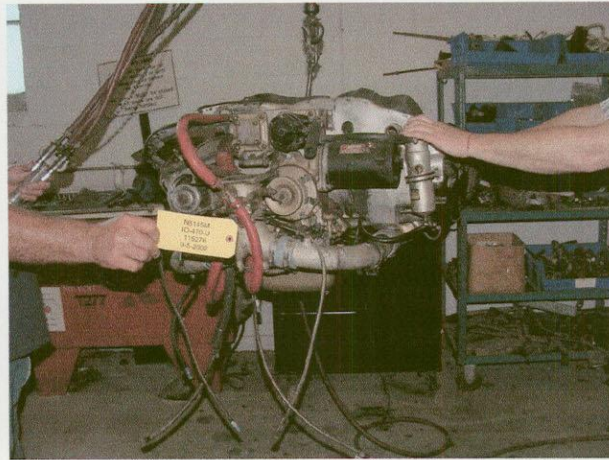
10. RIGHT SIDE



11. RIGHT REAR



12. REAR



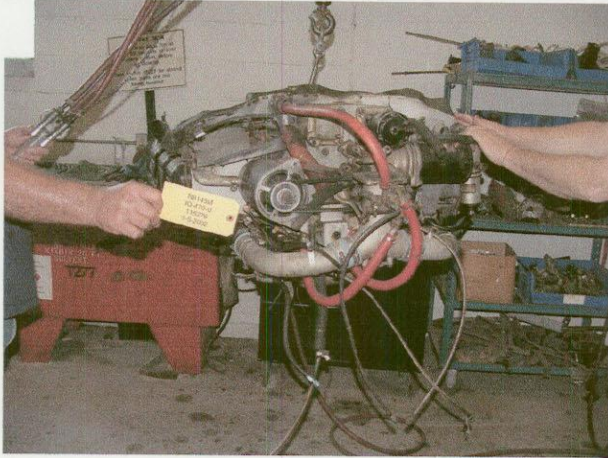




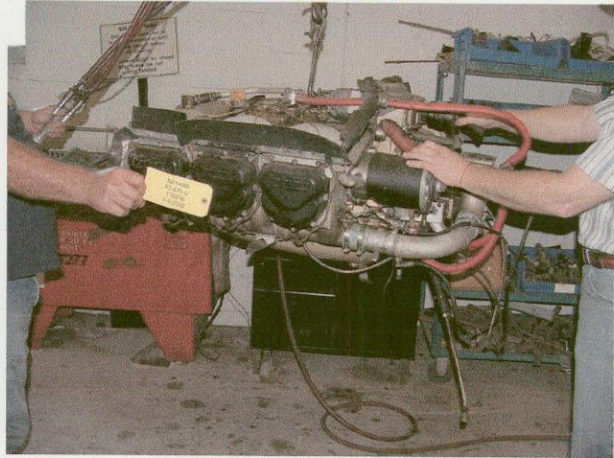
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**PHOTO LOG N8145M  
IO-470-U SERIAL 115276 (LEFT)**

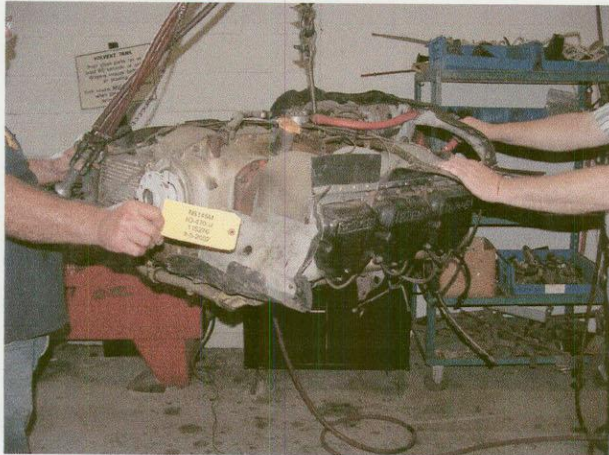
**13. LEFT REAR**



**14. LEFT SIDE**



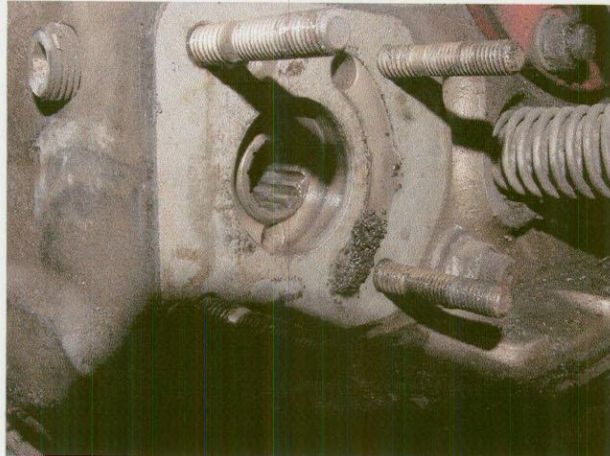
**15. LEFT FRONT**



**16. ENGINE OIL SCREEN**



**17. DEBRIS FOUND IN GOVERNOR  
SCREEN**



**18. DEBRIS FOUND IN SCREEN AT  
POINTER**





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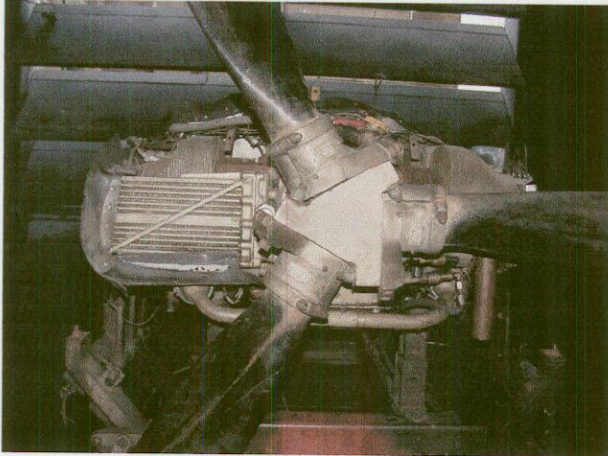
19. PROPELLER GOVERNOR



20. MISSING BAND CLAMP



21. FRONT ON TEST STAND



22. RIGHT SIDE



23. LEFT SIDE



24. LEFT REAR

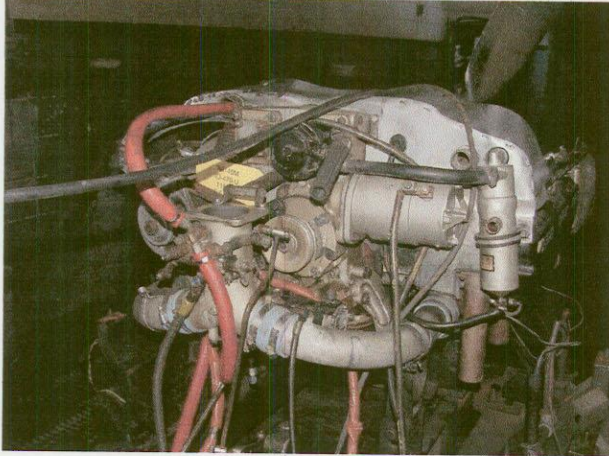




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**PHOTO LOG N8145M**  
**IO-470-U SERIAL 115276 (LEFT)**

**25. RIGHT REAR**



**26. FUEL METERING UNIT**



**27. FUEL PUMP**

