

**TELEDYNE CONTINENTAL MOTORS  
ANALYTICAL INSPECTION REPORT**

**DATE:** 10-5-95

**DISTRIBUTION:** J. Smith

**SUBJECT:** Accident Investigation  
Ref: N3911C  
GTSIO-520-L, serial 272089-R (right)  
GTSIO-520-L, serial 246013-R (left)

The above referenced engine was from a Cessna 421C, registration N3911C.

These engines were received at Teledyne Continental Motors (TCM), Mobile, AL and were stored unopened until the date of the inspection 10-5-95. At that time Aircraft Engine Receiver number A65530 for engine serial 272089-R and A65531 for serial number 246013-R were prepared.

Personnel participating in this inspection were:

Tom Wilcox -	NTSB, Los Angeles, CA
Steve Macon -	Allied Signal Phoenix, AZ
Andrew Hall -	Cessna Aircraft Co. Wichita, KS
Fred Fihe -	Teledyne Continental Motors Mobile, AL
John Little -	Teledyne Continental Motors Mobile, AL
Jim Ward -	Teledyne Continental Motors Mobile, AL

**GTSIO-520-L, serial 272089-R (Right)**

The engine was visually inspected and below are the initial observations:

TCM ANALYTICAL REPORT PHOTOGRAPHS, TSIO-520-L ENGINE  
REG. NO. N3911C

**PLEASE NOTE:**

**THE ENGINES IN THESE PHOTOGRAPHS ARE REVERSED.**

THE RIGHT ENGINE IS ACTUALLY THE LEFT ENGINE AND THE  
LEFT ENGINE IS THE RIGHT ENGINE.

PLEASE NOTE

**TELEDYNE CONTINENTAL MOTORS  
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- 1) The engine exhibited extensive fire damage. The entire engine and accessories were blackened with soot. The following parts exhibited heat damage and melting. These parts were the right magneto outer housing, starter rear cover, manifold valve top cover plate, alternator housing, rear of vacuum pump and right side intake elbows.
- 2) The ignition harness was burned and most of the fabric and silicon consumed, from the post impact fire.
- 3) The throttle body and the induction spider were not returned with this exhibit.
- 4) The oil cooler had some molten aluminum on the cooler cores rear side.
- 5) The right rear and left front engine mount legs were broken.
- 6) Oil sump was crushed upward on the right side.
- 7) Exhaust runner remained attached to the right and left cylinders. The right side exhaust runner was crushed upward.
- 9) Propeller governor top actuating head was broken, remainder of governor was intact.

The engine was mounted on an engine stand for disassembly.

Engine oil sump residual oil was dark. Some carbon and dirt were present in the sump bottom. No metallic debris or oil sludge were present.

Engine oil and scavenge pump gears, and their respective cavities were undamaged. The cavity walls were coated with burned oil residue. No signatures of hard particle passage were present.

All cylinder overhead components were intact and appeared operational.

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All cylinders were steel barreled, part number 649329. The original factory spot putty was present on all cylinder hold down nuts, indicating no cylinder removals since factory manufacture. The cylinder bores were coated with baked oil residue from the heat of the post impact fire. Combustion deposits were normal for color and slightly light for content. All valves appeared to be seating properly.

Piston rings were all free in their respective ring grooves. The piston crown deposits were normal for color and light for content. Piston skirt color was slightly dark from baked oil due to the post impact fire. All piston pins exhibited normal operational signatures, except number five which exhibited a loose aluminum extruded plug.

Crankcase main bearings exhibited normal operational signatures. The babbitt overlays were darkened from heat of the post impact fire. The babbitt overlays were intact. No bearing movement was observed.

Crankcase parting surfaces were free of any fretting signatures. No main bearing shift or bearing tang slot elongation was observed.

Crankshaft main journals exhibited normal polishing signatures. There was some journal darkening from oil baked onto the journal surface from the post impact fire. Number one connecting rod was removed to sample the connecting rod bearing condition. The babbitt overlay was intact. The bearing exhibited normal operational conditions.

Counterweights' movements were free and unrestricted indicating normal wear to the pins and bushings.

Propeller drive gear exhibited normal polishing to the gear teeth. Journal condition was normal.

Driver gear teeth exhibited normal polishing signatures. The drive gear journals exhibited normal polishing signatures.

Camshaft and lifters exhibited normal operational signatures. No lifter spalling or camshaft lobe wear was observed.

In conclusion, this engine exhibited normal operational signatures throughout, and appeared to be operational prior to this accident. The engine did receive extensive post impact fire damage.

**TELEDYNE CONTINENTAL MOTORS  
ANALYTICAL INSPECTION REPORT**

**COMPONENT LOG N3911C  
GTSIO-520-L, serial 272089-R (Right)**

**CRANKCASE P/N: 642080/642081  
S/N: J7A7226-OR**

**CRANKSHAFT P/N: NOT READABLE GROUND OFF  
S/N: 870971**

**MAIN BEARINGS: 634503**

**ROD BEARINGS: 630826**

**DRIVE GEAR BEARING P/N: 630571**

**PROPELLER GEAR BEARING P/N: 530386**

**CAMSHAFT: 653060**

**CYLINDERS: 649329 STEEL BARRELS**

**PISTONS: 648033**

**CONNECTING ROD: 632041F**

**MAGNETOS**

**RIGHT P/N: DATA PLATE MELTED**

**LEFT P/N: DATA PLATE MELTED**

**SPARKPLUG: CHAMPION RHB32E**

**FUEL PUMP P/N: 646210-3  
S/N: G0987268BR**

**THROTTLE &  
CONTROL ASSY P/N: NOT RETURNED WITH EXHIBIT**

**MANIFOLD VALVE P/N: 641032-1A7  
S/N: G088705CR**

**NOZZLE SIZE: D19B**

**STARTER P/N: NOT RECORDED**

**ALTERNATOR P/N: HOUSING MELTED AWAY NOT VISIBLE**

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**VACUUM PUMP P/N: FIRE DAMAGED NOT READABLE**

**TACH GENERATOR P/N: BROKEN OFF AND NOT RETURNED**

**PROPELLER GOVERNOR P/N: MCCAULEY DCFS290D2A/T6  
S/N: 760824**

**TELEDYNE CONTINENTAL MOTORS  
ANALYTICAL INSPECTION REPORT**

**GTSIO-520-L, serial 246013-R (left)**

The engine was visually inspected and below are the initial observations:

- 1) The engine exhibited extensive fire damage. The entire engine and accessories were blackened with soot. The following parts exhibited heat damage and melting. These parts were the left magneto outer housing, fuel pump aneroid housing, and oil cooler outer core.
- 2) The top of the engine was covered with dirt from the accident site.
- 3) Molten aluminum had dripped down on the left cylinders and around the left side of the oil sump.
- 4) The ignition harness was burned and most of the fabric and silicon consumed, from the post impact fire.
- 5) The throttle body and the induction spider were not returned with this exhibit.
- 6) The oil sump was crushed and the crankcase sump rails on the left side was broken.
- 7) The left front engine mount leg was broken.
- 8) Exhaust runners remained attached to the right and left cylinders. The left side exhaust runner was crushed and damaged.
- 9) Propeller governor was torn off the engine at its mounting flange.

The engine was mounted on an engine stand for disassembly.

Engine oil sump residual oil was dark from burned oil. Burn debris was present in the sump bottom consisting of melted aluminum. No oil sludge were present.

Engine oil and scavenge pump gears, and their respective cavities were undamaged. The cavity walls were coated with burned oil residue. No signatures of hard particle passage were present.

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All cylinder overhead components were intact and appeared operational.

All cylinders were steel barreled, part number 646100. The original factory spot putty was present on all cylinder hold down nuts, indicating no cylinder removals since factory manufacture. The cylinder bores were coated with baked oil residue from the heat of the post impact fire. Combustion deposits were normal for color and slightly light for content. All valves appeared to be seating properly. Number six cylinder rocker box broke off from impact damage.

Piston rings were all free in their respective ring grooves. The piston crown deposits were normal for color and light for content. Piston skirt color was slightly dark from baked oil due to the post impact fire. All piston pins exhibited normal operational signatures. All aluminum extruded plugs were tight.

Crankcase main bearings exhibited normal operational signatures. The babbitt overlays were darkened from heat of the post impact fire. The babbitt overlays were intact. No bearing movement was observed. The left crankcase exhibited breakage along the sump rail below the propeller governor.

Crankcase parting surfaces were free of any fretting signatures. No main bearing shift or bearing tang slot elongation was observed.

Crankshaft main journals exhibited normal polishing signatures. There was some journal darkening from oil baked onto the journal surface from the post impact fire. Number five connecting rod was removed to sample the connecting rod bearing condition. The babbitt overlay was intact. The bearing exhibited normal operational conditions.

Counterweights' movements were free and unrestricted indicating normal wear to the pins and bushings.

Propeller drive gear exhibited normal polishing to the gear teeth. Journal condition was normal.

Driver gear teeth exhibited normal polishing signatures. The drive gear journals exhibited normal polishing signatures.

Camshaft and lifters exhibited normal operational signatures. No lifter spalling or camshaft lobe wear was observed.



**TELEDYNE CONTINENTAL MOTORS  
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In conclusion, this engine exhibited normal operational signatures throughout, and appeared to be operational prior to this accident. The engine did receive extensive post impact fire damage.

The engine residuals were placed in storage pending disposition instructions.

A handwritten signature in cursive script, reading "Fred Fihe".

Fred Fihe  
Product Analysis Manager

**TELEDYNE CONTINENTAL MOTORS  
ANALYTICAL INSPECTION REPORT**

**COMPONENT LOG N3911C  
GTSIO-520-L, serial 246013-R (left)**

**CRANKCASE P/N: 642080/642081  
S/N: J6A6848-OR**

**CRANKSHAFT P/N: GROUND OFF  
S/N: D385U**

**MAIN BEARINGS: 634503**

**ROD BEARINGS: 630826**

**DRIVE GEAR BEARING P/N: 630571**

**PROPELLER GEAR BEARING P/N: 630386**

**CAMSHAFT: 646273**

**CYLINDERS: 646100 STEEL BARRELED**

**PISTONS: 648033**

**CONNECTING ROD: 646126F**

**MAGNETOS**

**RIGHT P/N: S6LN-1205**

**S/N: 85100652**

**LEFT P/N: FIRE DAMAGE NOT READABLE**

**SPARKPLUG: CHAMPION RHB32E**

**FUEL PUMP P/N: 646210-3  
S/N: CD38621RB**

**THROTTLE &  
CONTROL ASSY P/N: NOT WITH EXHIBIT**

**MANIFOLD VALVE P/N: FIRE DAMAGED**

**NOZZLE SIZE: D19B**

**STARTER P/N: 646275  
S/N: 7050709**

**TELEDYNE CONTINENTAL MOTORS  
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**ALTERNATOR P/N: DATA PLATE MISSING**

**VACUUM PUMP P/N: FIRE DAMAGED UNREADABLE**

**TACH GENERATOR P/N: BROKEN OFF MOUNTING PAD**

**PROPELLER GOVERNOR P/N: NOT RECORDED**

TELEDYNE CONTINENTAL MOTORS  
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L/H

REG NO. N 3911 C

INSP. DATE 10-5-95

FUEL INJECTED ENGINES  
TURBOCHARGED- GEARED

MODEL GTS10-520-L SERIAL NUMBER 272089 R

IN ATTENDANCE: Tom Wilcox NTSB  
Steve MAISON - SIGNAL ALLIED  
ANDREW HALL - CESSNA  
E Fike  
J LITTLE ) TCM  
J WARD

HOURS \_\_\_\_\_

REASON FOR INSPECTION Acc ACCIDENT LOCATION \_\_\_\_\_

AIRCRAFT TYPE \_\_\_\_\_ SERIAL \_\_\_\_\_ REG NO. \_\_\_\_\_

RECEIVER NO. A65530 DATE RECEIVED 10-5-95

SHIPPED FROM AIR TRANSPORT OWNER \_\_\_\_\_

COMMENTS \_\_\_\_\_

LOG BOOK RETURNED (Y/N) \_\_\_\_\_

SIGNIFICANT MAINTENANCE HISTORY \_\_\_\_\_

BUILD DATE \_\_\_\_\_ INSTALLED \_\_\_\_\_

EXTERNAL INSPECTION

DATA PLATE INSTALLED (Y/N) Y

MISSING COMPONENTS THROTTLE BODY

GENERAL CONDITION EXTENSIVE FIRE DAMAGE - melting  
Buffers, starter housing, RH MAGNETO HOUSING D/B,  
ALTERNATOR, INDUCTION ELBOWS RH, REAR VACUUM  
PUMP  
DAMAGE TO RH EXHAUST RUNNER  
Sump painted RT SIDE  
ENGINE MOUNTS BROKEN L-FRONT + R-REAR

CYLINDERS 1 3 5 2 4 6

SPOT PUTTY ON NUTS (Y/N) Y Y Y Y Y Y DARK FROM  
PAINT DISCOLORED (Y/N) \_\_\_\_\_

OIL COOLER MOLTEN ALUM Debris on REAR Side FIRE DAMAGE  
INDUCTION SYSTEM SPIDER MISSING - melted pipes on RT CYL'S  
FUEL SYSTEM NO THROTTLE BODY - FIRE DAMAGE TO MAN VALVE  
EXHAUST SYSTEM RUNNERS ATTACHED, RIGHT SIDE EXHIBIT  
CRUSH DAMAGE

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EXTERNAL DAMAGE see General Condition  
Comments

COMMENTS

AIRFRAME COMPONENTS Baffles Exhaust Runners,  
Prop Gov, Vacuum pump

TURN'S PROP GOVERNOR (Y/N) Y MODEL DCFS290D2<sup>N/T6</sup> S/N 760824  
VACUUM PUMP (Y/N) Y MODEL DATA PLATE S/N MELTED-TURNS STIF  
TACH GENERATOR (Y/N) N MODEL BROKEN OFF  
TURBOCHARGER (Y/N) N MODEL \_\_\_\_\_ S/N \_\_\_\_\_  
WASTE GATE (Y/N) N MODEL \_\_\_\_\_ S/N \_\_\_\_\_  
CONTROLLER (Y/N) N MODEL \_\_\_\_\_ S/N \_\_\_\_\_  
OVERBOOST VALVE (Y/N) N MODEL \_\_\_\_\_ S/N \_\_\_\_\_

OTHER COMPONENTS: Housing mounted to R/H accessory  
Adapter, BROKEN OFF

NOTES

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MAGNETOS

MODEL S6LN 1201/1205

	LEFT	RIGHT
COUPLING	P/N <u>      </u> S/N <u>      </u>	P/N <u>      </u> S/N <u>      </u>

DATA  
PLATE  
Melted

BENCH TEST:

IMPULSE THROW-OUT SPEED NA  
SPARK ACROSS 7MM GAP       

INTERIOR CHECKED (Y/N)       

"E" GAP        SPEC       

DISTRIBUTOR INTERIOR       

IGNITION HARNESS Burned

SPARK PLUGS MFG. CHAMPION P/N RHB 32 F

COMMENTS         
        
      

FUEL PUMP

PART NUMBER 646210-3 SERIAL G098726BR

DRIVE COUPLING CONDITION INTACT  
PUMP TURNS FREELY (Y/N) N SIEZED - FIRE DAMAGE  
FLOWED ON TEST BENCH (Y/N) N  
PUMP DISASSEMBLED (Y/N) N

COMMENTS: Broken inlet fitting  
~~BEFORE~~ FIRE DAMAGED

THROTTLE AND FUEL CONTROL

PART NUMBER        SERIAL       

LINKAGES         
FUEL SCREEN         
CONDITION MISSING

FLOW TESTED (Y/N)         
DISASSEMBLED (Y/N)       

COMMENTS:

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MANIFOLD VALVE, LINES AND NOZZLES

PART NUMBER 641032-1A7 SERIAL G088705C12

NOZZLE P/N 19B CLEAN (Y/N) \_\_\_\_\_

CONDITION TOP cover melted

FLOW TESTED (Y/N) N

DISASSEMBLED (Y/N) N

FUEL SCREEN NI

COMMENTS: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

ALTERNATOR

MODEL NO DATA PLATE SERIAL Visible

COUPLING TURNS

FREEDOM Free

COMMENTS EXTENSIVE IMPACT & FIRE Damage  
TO REAR HOUSING

STARTER ADAPTER

CONDITION NORMAL FIRE Damage

GEAR INTACT Normal Polishing

COMMENTS CASE Needle BEARING intact

SUMP

CONDITION OF OIL DARK

DEBRIS NO metallic Debris

PICKUP CLEAR

COMMENTS \_\_\_\_\_

OIL PUMP

CAVITY NORMAL

GEAR TEETH NORMAL

RELIEF VALVE & SEAT NI

COMMENTS \_\_\_\_\_

Scavenge Pump  
Normal

**TELEDYNE CONTINENTAL MOTORS  
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**CYLINDERS**

CYLINDER P/N 649329

	1	3	5	2	4	6
COMBUSTION						
CHAMBER DEPOSITS	<u>L</u>	<u>L</u>	<u>L</u>	<u>L</u>	<u>L</u>	<u>L</u>
	(L=LIGHT, N=NORMAL, D=DARK)					

**BARRELS:**

GLAZED (Y/N)

RUST (Y/N)

HONE PATTERN

COMMENTS

<u>N</u>	<u>N</u>	<u>N</u>	<u>N</u>	<u>N</u>	<u>N</u>
<u>N</u>	<u>N</u>	<u>N</u>	<u>N</u>	<u>N</u>	<u>N</u>
<u>N</u>	<u>N</u>	<u>N</u>	<u>N</u>	<u>N</u>	<u>N</u>

Bores NORMAL WEAR - HONE WORK  
IN RING TRAVEL AREA

**INTAKE VALVES:**

FACE

STEM

SEAT

GUIDE

SPRINGS

COMMENTS

_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____

**EXHAUST VALVES:**

FACE

STEM

SEAT

GUIDE

SPRINGS

COMMENTS

_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____

**INTAKE ROCKER ARMS:**

END

SOCKET

BUSHING

ROCKER SHAFTS

COMMENTS

_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____

**EXHAUST ROCKER ARMS:**

END

SOCKET

BUSHING

ROCKER SHAFTS

COMMENTS

_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____

**PUSHRODS**

STRAIGHTNESS

COMMENTS

_____	_____	_____	_____	_____	_____
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COMMENTS

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_



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PISTONS

PART NUMBER 648033

	1	3	5	2	4	6
CROWN DEPOSITS	<u>L</u>	<u>L</u>	<u>L</u>	<u>L</u>	<u>L</u>	<u>L</u>
SKIRT COLOR	<u>D</u>	<u>D</u>	<u>D</u>	<u>D</u>	<u>D</u>	<u>D</u>

(L=LIGHT, N=NORMAL, D=DARK)

SCORING \_\_\_\_\_

RINGS:

FREE

SLOT CLEAR

GAPS

Free

COMMENTS: \_\_\_\_\_

PISTON PINS

	1	3	5	2	4	6
PINS	<u>N</u>	<u>N</u>	<u>N</u>	<u>N</u>	<u>N</u>	<u>N</u>
ALUMINUM PLUGS						
TIGHT (Y/N)	<u>y-Except #5</u>					BROKEN (Y/N) <u>N</u>

COMMENTS \_\_\_\_\_

CRANKCASE

SERIAL J7A 7226 OR CASTING NO. 642080/642081

MAIN BEARINGS P/N 634503  
BABBITT INTACT (Y/N) \_\_\_\_\_  
LUBE DISTRESS (Y/N) \_\_\_\_\_

BEARING SUPPORTS No Fretting  
BEARING SHIFT (Y/N) N

THRUST WASHERS NORMAL  
CAMSHAFT BORES NORMAL  
PARTING SURFACE NO FRETTING  
CYL. DECKS NORMAL

COMMENTS \_\_\_\_\_

TELEDYNE CONTINENTAL MOTORS  
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CRANKSHAFT

SERIAL 870971 FORGING NO. GROUNDED HEAT CODE W46  
MAIN JOURNAL DIA 1 2 3 4  
ROD JOURNAL DIA 1 2 3 4 5 6  
JOURNAL CONDITION Normal Polishing  
LUBE DISTRESS (Y/N) N  
COUNTER WEIGHTS Free & Unrestricted  
COUNTER WEIGHT PINS NT  
OIL TRANSFER COLLAR NA

COMMENTS

DRIVE GEAR  
P/N 633265 SERIAL 718  
TEETH CONDITION NORMAL POLISHING  
JOURNAL DIA. FRONT REAR  
LUBE DISTRESS (Y/N) N NT NT  
BEARING P/N 630571

COMMENTS

PROPELLER DRIVE GEAR  
P/N 641483 SERIAL TN92  
TEETH CONDITION NORMAL POLISHING  
BEARING P/N 530386  
PROP FLANGE CONDITION NORMAL  
JOURNAL DIA. FRONT REAR  
LUBE DISTRESS (Y/N) N NT NT  
BEARING P/N 530386

COMMENTS

TELEDYNE CONTINENTAL MOTORS  
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QUILL SHAFT

CONDITION NOT Removed from Drive shaft  
INTACT

COMMENTS \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

CONNECTING RODS

FORGING NO. 632041 F

	1	3	5	2	4	6
BUSHINGS	<u>N</u>	<u>N</u>	<u>N</u>	<u>N</u>	<u>N</u>	<u>N</u>
BEARINGS	<u>NI</u>	<u>NI</u>	<u>NI</u>	<u>N</u>	<u>NI</u>	<u>NI</u>
BABBITT INTACT (Y/N)			<u>Y</u>			
LUBE DISTRESS (Y/N)			<u>N</u>			

BEARING  
P/N  
630826

BOLTS Tight #2 Removed

COMMENTS \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

CAM P/N 646277 CAMSHAFT

GOV. GEAR NORMAL WEAR  
WORN AT KEY WAY (Y/N) NORMAL  
LOBE WEAR NORMAL POLISHING

COMMENTS \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

LIFTERS

INTAKE P/N 646277  
EXHAUST P/N 646277

	1I	3I	5I	2I	4I	6I
S=SPALLED		<u>NO</u>		<u>SPALLING</u>		
R=RUSTY	1E	3E	5E	2E	4E	6E

COMMENTS \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

TELEDYNE CONTINENTAL MOTORS  
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GEARS

CRANKSHAFT \_\_\_\_\_

CAMSHAFT \_\_\_\_\_

STARTER SHAFT \_\_\_\_\_

OTHERS \_\_\_\_\_

*NORMAL*

COMMENTS \_\_\_\_\_

NOTES :

**TELEDYNE CONTINENTAL MOTORS  
ANALYTICAL INSPECTION REPORT**

**NOTES**

NA = Not applicable  
NI = Not Inspected  
N = Normal signatures

( ) = See note

# N.T.S.B.

(NATIONAL TRANSPORTATION SAFETY BOARD)

## DO NOT OPEN

DATE

9-14-95 D/L 9-2-95

AIRCRAFT REGISTRATION

N 3911C

ENGINE MODEL

GT510-520-L

ENGINE SERIAL NO.

272089-R

INVESTIGATOR

N75B - George Petras  
Deer Valley, AZ

[illegible]

[illegible]



**TELEDYNE CONTINENTAL MOTORS**

RGANBR. \_\_\_\_\_

AIRCRAFT ENGINE RECEIVER  
MOBILE, ALABAMA

NBR A 65530

COMMERCIAL _____		MILITARY _____		W.O. Nbr. _____	
MODEL <b>GTS10-520-L</b>	SPEC. _____	SERIAL NBR. <b>272089R</b>	ACFT MODEL & SERIAL # _____		REGISTRATION # <b>N 3911 C</b>
CARRIER <b>yellow</b>					PRO NBR. <b>065-649447</b>
RECEIVED FROM <b>AIR TRANSPORT</b>			ADDRESS <b>3011 W Buckeye Rd. PHOENIX, AZ 85009</b>		
ENGINE HOURS:	RGANBR. _____	LOG _____	REASON FOR ENGINE REMOVAL <b>Accident Investigation</b>		

STATUS OF ENGINE:	Exchange _____	Cond. Insp. _____	Warranty _____
Mil Priority T.D.R. _____	FAA _____	Acc. Invest. <b>X</b>	O.E.M. _____

PART NAME	PART NO.	INVENT- TORY	PART NAME	PART NO.	INVENT- TORY
Magneto - Left	<b>HEAT Damage</b>		Data Plate		<b>OK</b>
Magneto - Right	<b>Partically melted</b>		Spark Plugs		<b>OK</b>
Ignition Harness	<b>Burned</b>		Turbo	<b>MISSING</b>	
Starter	<b>Rear Cover Partically melted</b>		Turbo Bracket	<b>MISSING</b>	
Oil Cooler	<b>ALUM Debris on COOLER</b>		Exhaust System	<b>RUNNERS ATTACHED</b>	
Alternator/Generator	<b>MOUNTING FLANGE BROKEN</b>		Intercooler	<b>MISSING</b>	
Carburetor	<b>NA</b>		Freon Comp. Brk.	<b>NA</b>	
Fuel Pump	<b>NA</b>		Logbook		
<b>INJECTION</b>	Fuel Pump	<b>inlet fitting Broken</b>	<b>Airframe Parts: BUFFELS, VACUUM</b>		
	Throttle Control	<b>MISSING</b>	<b>pump (L PAD)</b>	<b>RT PAD Broken</b>	
	Manifold Valve	<b>TOP cover Partically melted</b>	<b>mount flange, Exhaust,</b>		
			<b>Prop Governor</b>		

OTHER MAJOR PARTS MISSING.

CONTAINERS:	OTHER _____	CONDITION OF CONTAINER		
TCM PART NBR. <b>631300</b>		SCRAP _____	REUSABLE _____	REPARABLE _____
REMARKS _____				
INSPECTED BY <b>File</b>	DATE <b>10-5-95</b>	QAR _____	DATE _____	

TELEDYNE CONTINENTAL MOTORS  
ANALYTICAL INSPECTION REPORT

R/14

REG NO. N3911C

INSP. DATE 10-5-95

FUEL INJECTED ENGINES  
TURBOCHARGED- GEARED

MODEL G7510-520-L SERIAL NUMBER 246013-R

IN ATTENDANCE:

TOM Wilcox NTSB  
STEVE MACON - ALLIED SIGNAL  
ANDREW HALL - CESSNA  
R Fine TCM  
J Little TCM

HOURS \_\_\_\_\_

REASON FOR INSPECTION Acc. ACCIDENT LOCATION \_\_\_\_\_  
AIRCRAFT TYPE \_\_\_\_\_ SERIAL \_\_\_\_\_ REG NO. N3911C  
RECEIVER NO. AG5531 DATE RECEIVED 9-20-95  
SHIPPED FROM AIR TRANSPORT OWNER \_\_\_\_\_  
COMMENTS \_\_\_\_\_

LOG BOOK RETURNED (Y/N) \_\_\_\_\_  
SIGNIFICANT MAINTENANCE HISTORY \_\_\_\_\_  
BUILD DATE \_\_\_\_\_ INSTALLED \_\_\_\_\_

EXTERNAL INSPECTION

DATA PLATE INSTALLED (Y/N) Y  
MISSING COMPONENTS THROTTLE BODY, TURBO + CONTROLLERS

GENERAL CONDITION BURNED AND COATED WITH  
DIRT

Breather Fitting

CYLINDERS 1 3 5 2 4 6

SPOT PUTTY ON NUTS (Y/N) Y Y Y Y Y Y  
PAINT DISCOLORED (Y/N) Y Y Y Y Y Y Burned

OIL COOLER PARTLY MELTED -  
INDUCTION SYSTEM THROTTLE BODY MISSING  
FUEL SYSTEM FUEL LINES DAMAGED AND BURNED  
EXHAUST SYSTEM TURBO + CONTROLLERS MISSING, LEFT  
EXHAUST TUBES DAMAGED

TELEDYNE CONTINENTAL MOTORS  
ANALYTICAL INSPECTION REPORT

EXTERNAL DAMAGE ENGINE BURNED

TOP - LEFT MAG & OIL COOLER PARTLY MELTED, ALTERNATOR PARTLY MELTED, FUEL PUMP BURNED & AN. HSG BROKEN OFF AND TUBES CUT OFF, GOV BROKE OFF

TOP OF ENGINE COATED WITH DIRT

BETRM - SUMP CRUSHED & TORN OPEN, LEFT EXH BENT, LEFT SUMP RAIL BROKEN, LEFT FRONT MOUNT BROKEN

VAC PUMP & HYD PUMP IN PLACE

MOTOR ALUM OVER 2, 4, 6 CYL AND MOUNT SUMP ON LEFT SIDE

COMMENTS OIL COOLER OUT BOARD ENG melted

AIRFRAME COMPONENTS Baffles, Exhaust components, Prop Governor - Broken off at base

PROP GOVERNOR (Y/N) N MODEL \_\_\_\_\_ S/N \_\_\_\_\_

VACUUM PUMP (Y/N) Y MODEL \_\_\_\_\_ S/N \_\_\_\_\_

TACH GENERATOR (Y/N) Y MODEL \_\_\_\_\_ S/N \_\_\_\_\_

TURBOCHARGER (Y/N) N MODEL \_\_\_\_\_ S/N \_\_\_\_\_

WASTE GATE (Y/N) N MODEL \_\_\_\_\_ S/N \_\_\_\_\_

CONTROLLER (Y/N) N MODEL \_\_\_\_\_ S/N \_\_\_\_\_

OVERBOOST VALVE (Y/N) N MODEL \_\_\_\_\_ S/N \_\_\_\_\_

OTHER COMPONENTS: \_\_\_\_\_

NOTES

TELEDYNE CONTINENTAL MOTORS  
ANALYTICAL INSPECTION REPORT

MAGNETOS

MODEL TCM 36LN-1201/1205 Partially melted  
COUPLING NA LEFT P/N DATA Plate S/N melted RIGHT P/N 56LN-1205 S/N 85100 652  
BENCH TEST:  
IMPULSE THROW-OUT SPEED NI NI  
SPARK ACROSS 7MM GAP NI NI RETURNS Tight  
INTERIOR CHECKED (Y/N)            
"E" GAP      SPEC      APPEAR HEAT  
DISTRIBUTOR INTERIOR      DAMAGE  
IGNITION HARNESS Burned - FIRE Damage  
SPARK PLUGS MFG. Champion P/N RHB 32E  
COMMENTS #1 Bottom slightly fouled, #3 Bottom wet  
GAP APPEARS OK

FUEL PUMP

PART NUMBER 646210-3 SERIAL CD38621RB  
DRIVE COUPLING CONDITION INTACT  
PUMP TURNS FREELY (Y/N) N Seized up - Heat Damage  
FLOWED ON TEST BENCH (Y/N) N  
PUMP DISASSEMBLED (Y/N) N  
COMMENTS: Aneroid Housing melted Exposing Aneroid

THROTTLE AND FUEL CONTROL

PART NUMBER      SERIAL       
LINKAGES      MISSING  
FUEL SCREEN       
CONDITION       
FLOW TESTED (Y/N)       
DISASSEMBLED (Y/N)       
COMMENTS:

TELEDYNE CONTINENTAL MOTORS  
ANALYTICAL INSPECTION REPORT

MANIFOLD VALVE, LINES AND NOZZLES

PART NUMBER melted SERIAL Melted Cover

NOZZLE P/N 19 B CLEAN (Y/N)         

CONDITION Top cover & Data Plate melted

FLOW TESTED (Y/N) N

DISASSEMBLED (Y/N) N

FUEL SCREEN         

COMMENTS: Fire Damaged  
          
        

ALTERNATOR

MODEL UNK SERIAL UNK

COUPLING         

FREEDOM Sized

COMMENTS CASE partially melted

STARTER ADAPTER

CONDITION OK

GEAR NORMAL GEAR WEAR

COMMENTS Dampner ~~normal~~ - Burned from Fire  
Damage

SUMP

CONDITION OF OIL Burned

DEBRIS NO Metallic - Melted Debris

PICKUP DAMAGED

COMMENTS Burned - crushed - melted ALUM

OIL PUMP

CAVITY N

GEAR TEETH N

RELIEF VALVE & SEAT NI

COMMENTS         

STARTER  
PIN 646275 Presto Lite  
s/n 7050709 4

Cessna  
HYD Pump  
DATA Plate  
Damaged

**TELEDYNE CONTINENTAL MOTORS  
ANALYTICAL INSPECTION REPORT**

**CYLINDERS**

CYLINDER P/N 646100

	1	3	5	2	4	6
COMBUSTION CHAMBER DEPOSITS	<u>L</u>	<u>L</u>	<u>L</u>	<u>L</u>	<u>L</u>	<u>L</u>
	(L=LIGHT, N=NORMAL, D=DARK)					

**BARRELS:**

GLAZED (Y/N) \_\_\_\_\_

RUST (Y/N) \_\_\_\_\_

HONE PATTERN \_\_\_\_\_

COMMENTS \_\_\_\_\_

ALL \_\_\_\_\_

UNKNOWN \_\_\_\_\_

looks normal inside \_\_\_\_\_

Burned oil on Bore wall

**INTAKE VALVES:**

FACE \_\_\_\_\_

STEM \_\_\_\_\_

SEAT \_\_\_\_\_

GUIDE \_\_\_\_\_

SPRINGS \_\_\_\_\_

COMMENTS \_\_\_\_\_

**EXHAUST VALVES:**

FACE \_\_\_\_\_

STEM \_\_\_\_\_

SEAT \_\_\_\_\_

GUIDE \_\_\_\_\_

SPRINGS \_\_\_\_\_

COMMENTS \_\_\_\_\_

NI

NI

**INTAKE ROCKER ARMS:**

END \_\_\_\_\_

SOCKET \_\_\_\_\_

BUSHING \_\_\_\_\_

ROCKER SHAFTS \_\_\_\_\_

COMMENTS \_\_\_\_\_

**EXHAUST ROCKER ARMS:**

END \_\_\_\_\_

SOCKET \_\_\_\_\_

BUSHING \_\_\_\_\_

ROCKER SHAFTS \_\_\_\_\_

COMMENTS \_\_\_\_\_

**PUSHRODS**

STRAIGHTNESS \_\_\_\_\_

COMMENTS \_\_\_\_\_

NI

COMMENTS

#6 intake cyl Rocker boss Broken off

TELEDYNE CONTINENTAL MOTORS  
ANALYTICAL INSPECTION REPORT

PISTONS

PART NUMBER 648033

	1	3	5	2	4	6
CROWN DEPOSITS	<u>L</u>	<u>L</u>	<u>L</u>	<u>L</u>	<u>L</u>	<u>L</u>
SKIRT COLOR	<u>D</u>	<u>D</u>	<u>D</u>	<u>D</u>	<u>D</u>	<u>D</u>

(L=LIGHT, N=NORMAL, D=DARK)

SCORING Very MINOR

RINGS:

FREE

SLOT CLEAR

GAPS

Free

COMMENTS: Heat Baked oil on SKIRTS

PISTON PINS

	1	3	5	2	4	6	
PINS	<u>T</u>	<u>T</u>	<u>T</u>	<u>T</u>	<u>T</u>	<u>T</u>	ALL NORMAL
ALUMINUM PLUGS							
TIGHT (Y/N)	<u>Tight</u>						BROKEN (Y/N) <u>N</u>

COMMENTS \_\_\_\_\_

CRANKCASE

SERIAL J6A 6848 OR CASTING NO. 642080/642081

MAIN BEARINGS P/N 634503  
BABBITT INTACT (Y/N) Y  
LUBE DISTRESS (Y/N) N None

PROP GEAR BEARING  
630386 "N"

BEARING SUPPORTS NORMAL  
BEARING SHIFT (Y/N) N

DRIVE GEAR BEARING  
630571 "N"

THRUST WASHERS N  
CAMSHAFT BORES N  
PARTING SURFACE N No fretting  
CYL. DECKS

COMMENTS Scuff rail. Broken Below Governor pad  
L C/Case

TELEDYNE CONTINENTAL MOTORS  
ANALYTICAL INSPECTION REPORT

CRANKSHAFT

SERIAL D385U FORGING NO. GROUND off HEAT CODE GROUND off  
 MAIN JOURNAL DIA 1 2 3 4  
 ROD JOURNAL DIA 1 2 3 4 5 6 NOT measured  
 JOURNAL CONDITION DARK - Some Burned oil from Heat  
 LUBE DISTRESS (Y/N) N DAMAGE  
 COUNTER WEIGHTS ALL free + unrestricted  
 COUNTER WEIGHT PINS NI  
 OIL TRANSFER COLLAR NA

COMMENTS CRANK NORMAL Except for dark color  
from HEAT DAMAGE (Post Accident)

DRIVE GEAR

P/N \_\_\_\_\_ SERIAL \_\_\_\_\_  
 TEETH CONDITION NORMAL MINIMAL WEAR  
 JOURNAL DIA. FRONT REAR  
NI NI  
 LUBE DISTRESS (Y/N) N  
 BEARING P/N 630386 Babbitt intact 630571

COMMENTS GEAR LOOKS GREAT  
Could not find P/N or Serial on gear

PROPELLER DRIVE GEAR

P/N \_\_\_\_\_ SERIAL \_\_\_\_\_  
 TEETH CONDITION Normal  
BEARING 630386  
 PROP FLANGE CONDITION NORMAL  
Could not find P/N & SERIAL on GEAR  
 JOURNAL DIA. FRONT REAR  
NI NI  
 LUBE DISTRESS (Y/N) N  
 BEARING P/N 630571 Babbitt intact

COMMENTS good shape



TELEDYNE CONTINENTAL MOTORS  
ANALYTICAL INSPECTION REPORT

CONDITION QUILL SHAFT  
INTACT.

COMMENTS NOT Removed from Drive gear

CONNECTING RODS

FORGING NO. 646126 F

	1	3	5	2	4	6
BUSHINGS	<u>NI</u>	<u>NI</u>	<u>NI</u>	<u>NI</u>	<u>NI</u>	<u>NI</u>
BEARINGS	<u>NI</u>	<u>NI</u>	<u>NI</u>	<u>NI</u>	<u>NI</u>	<u>NI</u>

BABBITT INTACT (Y/N) Y

LUBE DISTRESS (Y/N) N

checked NO 2 only

BOLTS Tight #2

COMMENTS

CAMSHAFT  
CAM P/N 646273

GOV. GEAR N

WORN AT KEY WAY (Y/N) NORMAL POLISHING

LOBE WEAR NORMAL POLISHING

COMMENTS

LIFTERS

INTAKE P/N 628488

EXHAUST P/N 641709

	1I	3I	5I	2I	4I	6I
S=SPALLED	<u>NI</u>	<u>NI</u>	<u>NI</u>	<u>NI</u>	<u>NI</u>	<u>NI</u>
R=RUSTY	<u>NI</u>	<u>NI</u>	<u>NI</u>	<u>NI</u>	<u>NI</u>	<u>NI</u>

NORMAL

COMMENTS Baked oil on lifter faces  
From heat (POST IMPACT)

TELEDYNE CONTINENTAL MOTORS  
ANALYTICAL INSPECTION REPORT

GEARS

CRANKSHAFT \_\_\_\_\_  
CAMSHAFT \_\_\_\_\_  
STARTER SHAFT \_\_\_\_\_  
OTHERS \_\_\_\_\_

*All NORMAL*

COMMENTS \_\_\_\_\_

NOTES :

**TELEDYNE CONTINENTAL MOTORS  
ANALYTICAL INSPECTION REPORT**

**NOTES**

NA = Not applicable  
NI = Not Inspected  
N = Normal signatures

( ) = See note

**TELEDYNE CONTINENTAL MOTORS**  
**AIRCRAFT ENGINE RECEIVER**  
**MOBILE, ALABAMA**

RGA NBR. \_\_\_\_\_

NBR. A 65531

COMMERCIAL _____		MILITARY _____		W.O. Nbr. _____					
MODEL SPEC. <u>GTS10-520-L</u>		SERIAL NBR. <u>246013-R</u>		ACFT MODEL & SERIAL # _____					
CARRIER <u>YELLOW</u>		RECEIVED FROM <u>AIR TRANSPORT</u>		REGISTRATION # <u>N3911C</u>					
ENGINE HOURS: <table border="1"><tr><td>RGA</td><td>LOG</td></tr><tr><td> </td><td> </td></tr></table>		RGA	LOG			REASON FOR ENGINE REMOVAL _____		PRO NBR. <u>065-649447-4</u>	
RGA	LOG								
ADDRESS <u>3011 W. BUCKLEY RD PHOENIX AZ 85009</u>									

STATUS OF ENGINE: Exchange \_\_\_\_\_ Cond. Insp. \_\_\_\_\_ Warranty \_\_\_\_\_

Mil Priority T.D.R. \_\_\_\_\_ FAA \_\_\_\_\_ Acc. Invest. X O.E.M. \_\_\_\_\_

PART NAME		PART NO.	INVENTORY	PART NAME		PART NO.	INVENTORY
Magnetos - Left		<u>DAMAGED</u>		Data Plate		<u>✓</u>	
Magnetos - Right		<u>DAMAGED</u>		Spark Plugs		<u>✓</u>	
Ignition Harness		<u>DAMAGED</u>		Turbo		<u>MISSING</u>	
Starter		<u>✓</u>		Turbo Bracket		<u>MISSING</u>	
Oil Cooler		<u>DAMAGED</u>		Exhaust System		<u>DAMAGED</u>	
Alternator/Generator		<u>DAMAGED</u>		Intercooler		<u>—</u>	
Carburetor		<u>—</u>		Freon Comp. Brk.		<u>—</u>	
Fuel Pump		<u>—</u>		Logbook		<u>MISSING</u>	
INJECTION	Fuel Pump	<u>DAMAGED</u>		Airframe Parts:		<u>—</u>	
	Throttle Control	<u>MISSING</u>		<u>VAC. &amp; HYD. PUMPS</u>			
	Manifold Valve	<u>DAMAGED</u>					

OTHER MAJOR PARTS MISSING.

CONTAINERS:	OTHER	CONDITION OF CONTAINER		
TCM PART NBR. <u>631300</u>		SCRAP	REUSABLE	REPARABLE
REMARKS				

INSPECTED BY <u>J. WOODWARD</u>	DATE <u>10-3-95</u>	QAR	DATE
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# N.T.S.B.

(NATIONAL TRANSPORTATION SAFETY BOARD)

## DO NOT OPEN

DATE

9-14-95 A/L 9-2-95

AIRCRAFT REGISTRATION

N3911C

ENGINE MODEL

GT510-520-L (11)

ENGINE SERIAL NO.

246013 R

INVESTIGATOR

NTSB George Peterson  
DEER VALLEY A2

VELOCITY 2 DELIVERY ORDER # 1026 BILLY P. 20-95 FREIGHT BILL NO. 065 649447-4

SHIPPER: NAME: JIM W. SPORTELLO ADDRESS: 3011 W. BROADWAY CITY: KANSAS CITY STATE: MO ZIP: 64109

CONSIGNEE: NAME: TRACY L. HARRIS ADDRESS: 3011 W. BROADWAY CITY: KANSAS CITY STATE: MO ZIP: 64109

DATE	EXTENSION
10/25/95	
10/26/95	
10/27/95	
10/28/95	
10/29/95	
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11/30/95	

TTL WT LBS. DELIVERED BY: POS: DATE: