



Teledyne Continental Motors, Inc.

A Teledyne Technologies Company

ENGINE ANALYSIS REPORT

Date	Engine Model TSIO 520BE	Engine Serial number 273807-R	Aircraft Registration no. N9127L	30F 12
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REPORT SUMMARY:

On 06-20—06-21-02 The engine from N9127L was disassembled and examined at the facility of the Naples Airport Authority hanger, in Naples Florida. The engine was free in rotation, and finger compression and suction was established on all cylinders prior to disassembly. There was engine continuity through the entire gear train, and all valve action was normal in operation. The overall condition and visual inspection of the engine and parts did not reveal any discrepancies which would have precluded normal operation prior to impact.

EXTERNAL INSPECTION OF ENGINE

The engine impacted on the propeller spinner.

The oil sump, exhaust system, intake tubes, and the oil cooler were crushed.

The engine mounts, both magnetos, and both vacuum pumps were broken from their mounts.

One propeller blade was bent back and broken loose in the hub.

The oil dip stick was driven through the sump.

ENGINE TEARDOWN AND EXAMINATION

INDUCTION SYSTEM

All intake tubes were crushed or broken.



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EXHAUST SYSTEM

All exhaust pipes were crushed.

IGNITION SYSTEM:

MAGNETOS:

RIGHT MODEL: TCM S6RSC 25P-Yellow label
P/N BL500556-101

SERIAL: C210022DR

LEFT MODEL: TCM S6RSC-2?—Blue label
P/N BL500556-?01

SERIAL: ??00001DR

Both magnetos produced spark when rotated by hand. Both were broke at the magneto mounting.

IGNITION HARNESS: TCM-yellow.

The harness was intact, and appeared new in condition.

SPARK PLUGS:

MFG: Champion P/N: RHB32E

All spark plugs were replaced at the 06-19-02 annual inspection. All were gapped at .019, and no spark plugs were fouled or indicated any abnormal combustion signatures.

FUEL SYSTEM:

FUEL PUMP:

MFG: TCM

P/N: 649368-20

S/N: B001A178

The fuel pump was free in rotation, and the fuel pump drive coupling was intact. There was fuel present in the pump when rotated. The pump was not disassembled, and was retained for farther inspection and bench testing.



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MANIFOLD VALVE:

MFG: TCM P/N: 646733-142 S/N: 568??50CR

The manifold valve was disassembled and the diaphragm was intact, the fuel screen was clean, and the piston was free in movement. There was fuel present in the valve.

INJECTOR LINES:

All injector lines were intact and tight.

NOZZLES:

P/N: 19B

All fuel nozzles were clear of obstructions.

THROTTLE BODY/METERING UNIT:

P/N: ??6081

S/N: U/K

The throttle valve was in the full open position and the throttle body was broken. The metering unit was clear of obstructions and was free in rotation.

CARBURETOR: N/A-not installed.

MFG:

MODEL:

P/N:

S/N:



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LUBRICATION SYSTEM:

OIL PUMP / RELIEF VALVE/SEAT:

The oil pump was disassembled. The spline drive was intact and the cavity and gears were free from scoring or pitting. There was presence of oil in the oil pump. The relief valve seat was smooth and seated properly. The valve spring was intact.

OIL SUMP:

The oil sump was crushed upwards and the dipstick had punctured the sump. There was no metal or particles found in the sump. All oil was lost.

OIL PICKUP TUBE & SCREEN:

The pickup tube was crushed and the screen was clean.

CYLINDERS:

P/N: #1 654966F

#3 "

#5 "

#2 "

#4 "

#6 "

All cylinders were intact and had presence of oil on the cylinder walls. All were free from scoring or pitting. The #4 and #5 cylinders were replaced at the 06-19-02 annual inspection. (4643.3 Hobbs.) The combustion areas had minimum carbon deposits.

VALVES:



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EXHAUST: MFG: P/N

INTAKE: MFG: P/N

All valves were intact and were seated properly.

VALVE SPRINGS:

All valve springs, retainers, rocker arms, shafts and pushrods were intact.

PISTONS:

MFG: AE 109 P/N MW130196

All pistons and pins were intact and free from scoring. . Oil was present on all pistons. The piston crowns exhibited very little carbon build-up. (The pistons had been installed in the engine, without being cleaned, for 342.7 hours)

RINGS:

MFG:

All piston rings were intact and free moving in their grooves.

PISTON PINS:

All pins were intact.

CRANKCASE ASSEMBLY:

CRANKCASE:

P/N: L169912R, L169912L

S/N:



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The crankcase was intact. There was no fretting of the case halves. Oil was present throughout the internal portions of the crankcase.

MAIN BEARINGS:

MFG: P/N: 634503

All main bearings were smooth, without scoring or pitting, and oil was present on all surfaces.

CRANKSHAFT ASSEMBLY:

CRANKSHAFT:

P/N: 99706N S/NV: 649878 KMV HEAT CODE:

The crankshaft was intact, and the bearing surfaces were smooth without scoring or pitting. Oil was present on all surfaces.

TRANSFER COLLAR:

The collar was intact, with oil present in the collar.

COUNTER WEIGHTS: All counterweights were intact and free moving on their respective pins.



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CONNECTING RODS:

MFG: 646126N

FORGING NUMBER: Assy. 646476

All connecting rods were intact, and appeared straight.

ROD BEARINGS:

MFG:

P/N:

No excessive clearance was noted at the rod bearings. Oil was present on all bearings

CAMSHAFT:

MFG: TCM

P/N: 653058

S/N: 970095

The camshaft was intact and free of scoring or pitting on the lobes or bearing surfaces. Lubrication was present on all surfaces.

LIFTERS:

INTAKE: MFG: TCM

P/N 653888

EXHAUST MFG: TCM

P/N: 653877

All lifters were intact and the surfaces were free from scoring, pitting or spalling. Oil was present on all lifters.



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GEAR TRAIN: The crankshaft, camshaft, propeller governor drive, magneto idler and the magneto drive gears were all intact. Oil was present and there was minimal gear tooth wear.

ACCESSORIES:

STARTER ADAPTER:

P/N: 629530

The adapter was intact, and free in movement. The unit was rebuilt, stamped July 19,00.

STARTER:

MFG: TCM

P/N 646275-1RX

S/N: A166334

The starter was rebuilt by Aero Electric, and was free in rotation.

GENERATOR / ALTERNATOR:

MFG: Rear-TCM (Rebuilt by Aero Electric)
Front-Electro System

P/N 646843RX
P/N ES4005-2

S/N F209609.0R
S/N 4052312N

Both alternators were free in rotation.

TURBOCHARGER:

MFG: Left-Garrett
Right-Garrett

P/N: 646677
P/N 646677

S/N: AA002492
S/N AA002493

TURBO CONTROLLER:

MFG: Allied Signal

P/N: YDC31072

S/N:



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WASTE GATE:

MFG:

P/N:

S/N:

The waste gates and valves were intact.

VACUUM PUMP:

MFG: Right-Parker
Left-Rapco

P/N: 28C444CW-6
P/N 442CW-6

S/N: 10AN53
S/N90175

Both pumps were broken from their mounts. The Rapco pump was broken open.

PROPELLER:

MFG Hartzell

MODEL: CHC-C2YF-1BF

S/N: AM2939

BLADES S/N: 1.

2.

3.

4.

One blade was bent rearward and broken loose in the hub.



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PROPELLER GOVERNOR:
MFG Hartzell

P/N: 4990SJ

S/N:

NOTES