



BAM Aircraft, Limited Partnership • Waco Regional Airport

Engine Previous Total: 976.5
Hour Meter: 164.5
Since Major Overhaul: 00.0
Propeller Total: 00.0
Date: 09/01/04

TCM GTS10-520-L Left S/N 808306

Above referenced engine overhauled to new parts limits per FAR 43.2 (a) (1) (2) to conform w/TCM SM X-30045A. All gears cleaned, polished when required, inspected, magnafluxed, and no cracks found. Finish and dimensional limits within RAM Gear Inspection Specification No. 1818, Rev E dated 5/18/98. Installed above referenced engine in left position of Cessna S/N 421C0096. Installed new camshaft p/n 653056 s/n Z03IA410. Installed new VAR crankshaft P/N 653020 S/N N03FA096. AD 99-19-01 N/A per crankshaft date of manufacture I/A/W TCM CSB99-6A. Engine assembled with new TCM heavy style crankcase P/N 654119-12A1, S/N R03HA406 modified to RAM P/N 1509-4 per STC SE8338SW. Installed new TCM nickel plated cylinders. Cylinder hold nuts replaced and torqued per Overhaul Manual Supplement. Installed Floscan transducer per STC SE5726SW. Installed new McCauley propeller model 3FF32C501/90UMB-0 S/N 022268. Engine accessories exchanged for overhauled or new units except as noted. Installed new prop governor S/N 040007. Re-used customer's hydraulic pump and tach generator. Installed overhauled turbocharger P/N 465930-9003, S/N HER00279. AD 76-02-07 N/A per installation of ALV9510 alternator. Installed overhauled wet vacuum pump P/N 3P207JA, S/N PED8003. Installed new RAM/FAA/PMA fuel nozzles P/N 2563-19A. Re-installed customer's Champion RHB32S spark plugs. Re-installed customer's engine pre-heaters. SB94-8A on magneto timing procedure C/W per timing to data plate TC degree requirements with TDC locator and protractor with pointer. Engine modified to GTSIO-520-L per Continental Service Bulletin M-75-6. Installed RAM/FAA/PMA rocker arms P/N 1654-1 and -2. Cadmium plating of engine hardware and associated lines and fittings per QQ-P-416C Class 2, Type II. AD 2000-01-16 C/W, see airframe log for details. Installed new Aeroquip integral firesleeved fuel, oil and hydraulic hoses meeting TSO-C53A Type D and TSO-C75 Type III. Installed overhauled oil cooler P/N 646685, S/N C04-39394-4/60900. Exhaust slip joints modified per STC SA4592SW. C/W AD 79-05-09 per installation of new current design oil pressure plunger assy. Starter adapter shaftgear and crankshaft gear inspection C/W per TCM Service Bulletin CSB94-4D per installation of Service Kit EQ6642 with bushing P/N 654472. Category 1 thru 3 TCM Service Bulletin Compliance Listing in RAM Manual. Relocated turbo oil supply line per RAM Dwg. No. 1224, per latest Rev. per STC SE8338SW. Engine serviced with Phillips multi-grade 20W50 Type M mineral oil. See RAM Recommended Oil Grace Maintenance Tip MT-1 for recommended oils. Above referenced engine eligible for 1600 hr. TBO per TCM SIL98-9 Rev. A. CSB664 (Bendix Magneto) N/A per capacitor with red insulator installed. CSB665A (Bendix Magneto) C/W by inspection per paragraph A. AD 82-13-01 (Bendix Magneto) is N/A per TCM factory rebuilt magnetos installed. All aluminum alloy engine parts were coated per RAM Specifications No. 1142. Propeller balanced per Service Manual with spinner and bulkhead installed. Installed spring loaded induction clamps p/n 1170-1 per STC SE3767SW. Installed RAM/FAA/PMA rocker box cover gaskets p/n 1366-1. Engine ground run on test stand per RAM specifications for 3 hours. Engine pump pressure, idle, mixture, fuel flow, max RPM manifold pressure, and oil pressure adjusted per TCM SID97-3B. Engine ground run power test good. All engine systems checked for leaks. Engine approved for return to service for work performed. Pertinent details on file under project no. 1567

Bob F. S.

RAM Aircraft, Limited Partnership, P.O. Box 5219, Waco, Texas 76708 CRS VA1R551K

SUB-TOTALS this page

WATERFALLS - ~~Can be forwarded to next node~~

DATE	TOTAL TIME IN SERVICE	TOTAL TIME SINCE OVERHAUL	TACH OR RECORDING METER TIME	DESCRIPTION OF WORK PERFORMED— SIGNATURE & CERTIFICATE NO. OF PERSON PERFORMING WORK
				TOTALS brought forward from previous page

Powerplant Logbook Insert

N31C

LEFT

10-14-04 HOBBS TIME: 199.8

CHANGED OIL AND FILTER NO CONTAMINATION NOTED IN FILTER. SERVICED ENGINE WITH PHILLIPS X COUNTRY 20W50. GROUND RUN LEAK CHECK GOOD

LESLIE A BLOUNT
A&P 363502653



Left Powerplant Logbook Insert

N31C 01-25-05 HOBBS HOURS 242.8

CHANGED OIL & FILTER-NO CONTAMINATION NOTED IN FILTER. SERVICED ENGINE WITH PHILLIPS X/C 20W-50 OIL. COMPLIED WITH AD 2000-01-16 PARA. B. VISUAL INSPECTION OF EXHAUST SYSTEM.NO DEFECTS NOTED.

STEVEN D. ROBINSON
A&P 546377518

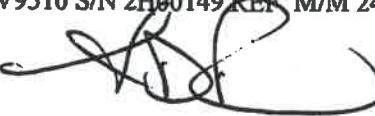


Powerplant Logbook Insert

N31C 02-07-05 HOBBS HOURS 255.5

L/ALTERNATOR INOP. REMOVED OLD ALTERNATOR & INSTALLED SERVICABLE ALTERNATOR P/N ALV9510 S/N 2H00149 REF M/M 24-30. OPS CHECK GOOD.

STEVEN D. ROBINSON
A&P 546377518



Powerplant Logbook Insert

N31C

LEFT

4-15-05 HOBBS TIME: 291.2

CHANGED OIL AND FILTER NO CONTAMINATION NOTED IN FILTER. SERVICED ENGINE WITH PHILLIPS X COUNTRY 20W50. GROUND RUN LEAK CHECK GOOD. C/W AD 2000-01-16 BY VISUAL INSPECTION OF EXHAUST.

LESLIE A BLOUNT
A&P 363502653



SUB-TOTALS this page

TOTALS—Carry forward to next page

DATE	TOTAL TIME IN SERVICE	TOTAL TIME SINCE OVERHAUL	TACH OR RECORDING METER TIME	DESCRIPTION OF WORK PERFORMED— SIGNATURE & CERTIFICATE NO. OF PERSON PERFORMING WORK
TOTALS brought forward from previous page				

Powerplant Logbook Insert
LEFT

N31C

7-08-05 HOBBS TIME: 317.1 TOTAL TIME: 1129.1 SMOH:152.6
 C/W AD 2000-01-16 BY VISUAL INSPECTION REMOVING AND
 INSPECTION TAIL PIPE AND PRESSURE CHECKING EXHAUST IAW PAR.
 B,C & E. CLEANED AND GAPED PLUGS CHECKED MAG TIMEING AND
 CLEANED FUEL NOZZLES. COMPRESSION CHECK GOOD #1 74/80 #2
 72/80 #3 72/80 #4 72/80 #5 74/80 #6 75/80. GROUND RUN LEAK CHECK
 GOOD. I CERTIFY THAT THIS ENGINE WAS INSPECTED I/A/W AN
 ANNUAL 100HR INSPECTION AND FOUND TO BE IN AIRWORTHY
 CONDITION.

LESLIE A BLOUNT
 A&P 363502653

Leslie A Blount

Powerplant Logbook Insert

N31C

LEFT

8-29-05 HOBBS TIME: 341.2

CHANGED OIL AND FILTER NO CONTAMINATION NOTED IN
 FILTER. SERVICED ENGINE WITH PHILLIPS X COUNTRY 20W50.
 GROUND RUN LEAK CHECK GOOD. C/W AD 2000-01-16 (B) BY VISUAL
 INSPECTION OF EXHAUST.

LESLIE A BLOUNT
 A&P 363502653

Leslie A Blount

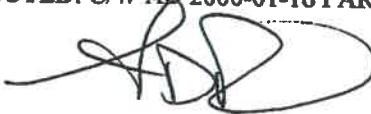
Left Powerplant Logbook Insert

N31C 01-11-06

HOBBS TIME 387.5

L/ENGINE OIL CHANGE. DRAINED OIL-SERVICED WITH PHILLIPS XC
 20W-50. INSPECTED OIL FILTER-NO CONTAMINATION NOTED. RAN
 ENGINE FOR LEAK CHECK-NONE NOTED. C/W AD 2000-01-16 PARA. 'B'-
 NO DEFECTS NOTED.

STEVEN D. ROBINSON
 A&P 546377518



SUB-TOTALS this page

TOTALS—Carry forward to next page

DATE	TOTAL TIME IN SERVICE	TOTAL TIME SINCE OVERHAUL	TACH OR RECORDING METER TIME	DESCRIPTION OF WORK PERFORMED— SIGNATURE & CERTIFICATE NO. OF PERSON PERFORMING WORK
				TOTALS brought forward from previous page

Left Powerplant Logbook Insert

N31C 3-30-06 HOBBS TIME 437.4
 L/ENGINE OIL CHANGE. DRAINED OIL & SERVICED WITH PHILLIPS X/C 20W-50. INSPECTED OIL FILTER FOR CONTAMINATION-NONE NOTED. GROUND RAN ENGINE FOR LEAK CHECK-NONE NOTED. C/W AD 200-01-16 PARA. A-NO DEFECTS NOTED.

STEVEN D. ROBINSON
 A&P 546377518

Powerplant Logbook Insert LEFT

N31C

7-06-06 HOBBS TIME: 482.1 TOTAL TIME: 1293.6 SMOH:317.6
 C/W AD 2005-20-04 STARTER DRIVE ADAPTOR BACKLASH
 MEASURES .03 ON ALL FOUR POSITIONS. C/W AD 2000-01-16 BY VISUAL INSPECTION REMOVING AND INSPECTION TAIL PIPE AND PRESSURE CHECKING EXHAUST IAW PAR. B,C & E. CLEANED AND GAPED PLUGS CHECKED MAG TIMEING AND CLEANED FUEL NOZZLES. CHANGED OIL AND FILTER NO CONTAMINATION NOTED IN FILTER. CLEANED OIL PRESSURE RELIEF VALVE. COMPRESSION CHECK GOOD #1 74/80 #2 73/80 #3 74/80 #4 73/80 #5 74/80 #6 75/80. GROUND RUN LEAK CHECK GOOD. I CERTIFY THAT THIS ENGINE WAS INSPECTED I/A/W AN ANNUAL 100HR INSPECTION AND FOUND TO BE IN AIRWORTHY CONDITION.

LESLIE A BLOUNT
 A&P 363502653

Powerplant Logbook Insert

N31C

11-16-06 HOBBS TIME: 530.4

INSTALLED OVERHAULED ALTERNATOR SER. NO. 9L00
 CHANGED OIL AND FILTER NO CONTAMINATION NOTED
 SERVICED ENGINE WITH PHILLIPS X COUNTRY 20W50. GRC
 LEAK CHECK GOOD. C/W AD 2000-01-16 BY VISUAL INSPEC
 EXHAUST.

LESLIE A BLOUNT
 A&P 363502653

Business authority different than the airworthiness authority
 parts/assemblies from the airworthiness authority

ASE CERTIFICATE
 BUSINESS APPROVAL TAG

	SUB-TOTALS this page	10. Quantity:	11. Serial/Batch Num
	TOTALS—Carry forward to next page	1	9L000442

DATE	TOTAL TIME IN SERVICE	TOTAL TIME SINCE OVERHAUL	TACH OR RECORDING METER TIME	DESCRIPTION OF WORK PERFORMED— SIGNATURE & CERTIFICATE NO. OF PERSON PERFORMING WORK
				TOTALS brought forward from previous page
Left Engine Logbook				
06-15-2007 N31C TCM GTSIO-520-L s/n: 808306	ACTT: 4892.2 Hobbs: 624.3	LETT: 1435.8 LETSO: 459.8 LPTT: 459.8 LPTSO: new	RETT: 1559.0 RETSO: 459.8 RPTT: 459.8 RPTSO: new	
<p>Complied with AD2000-01-16 (Exhaust System, last revised 1/10/2000) part b by visual inspection – no defects noted, next due 4942.2 ACTT. Removed and replaced oil and filter, cut filter open – on metal noted. Serviced engine with CH48111-1 oil filter and 12 quarts of Phillips 20w-50 oil. Ground ran, leak, and operational checks satisfactory. All Work performed in accordance with applicable manuals.</p> <p>Wyat Hatz A&P2706256 <i>W.Hatz</i></p>				
Powerplant Logbook Insert				
LEFT				
N31C	7-06-07 HOBBS TIME: 629.8	TOTAL TIME: 1441.3 SMOH:465.3		
	C/W AD 2005-20-04 STARTER DRIVE ADAPTOR BACKLASH			
	MEASURES .03 ON ALL FOUR POSITIONS. C/W AD 2000-01-16 BY VISUAL			
	INSPECTION REMOVING AND INSPECTION TAIL PIPE AND PRESSURE			
	CHECKING EXHAUST LAW PAR. B,C & E. CLEANED AND GAPED PLUGS			
	CHECKED MAG TIMEING AND CLEANED FUEL NOZZLES. INSTALLED			
	NEW PROP BRUSHES. INSTALLED NEW UREA UPERDECK REFERANCE			
	LINE. CHANGED OIL AND FILTER NO CONTAMINATION NOTED IN			
	FILTER. CLEANED OIL PRESSURE RELIEF VALVE. COMPRESSION			
	CHECK GOOD #1 75/80 #2 74/80 #3 74/80 #4 74/80 #5 75/80 #6 75/80.			
	GROUND RUN LEAK CHECK GOOD. I CERTIFY THAT THIS ENGINE WAS			
	INSPECTED I/A/W AN ANNUAL 100HR INSPECTION AND FOUND TO BE			
	IN AIRWORTHY CONDITION.			
	LESLIE A BLOUNT			<i>Leslie A. Blount</i>
	A&P 363502653			
Left Engine Logbook				
10-29-2007 N31C TCM GTSIO-520-L s/n: 808306	ACTT: 4942.0 Hobbs: 674.1	LETT: 1485.6 LETSO: 509.6 LPTT: 509.6 LPTSO: new	RETT: 1608.8 RETSO: 509.6 RPTT: 509.6 RPTSO: new	
<p>Complied with AD2000-01-16 (Exhaust System, last revised 1/10/2000) part b by visual inspection – no other defects noted, next due 4992.0 ACTT. Removed and replaced oil and filter, cut filter open – on metal noted. Serviced engine with CH48111-1 oil filter and 12 quarts of Phillips 20w-50 oil. Ground ran, leak, and operational checks satisfactory. All Work performed in accordance with applicable manuals.</p> <p>Wyat Hatz A&P2706256 <i>W.Hatz</i></p>				
SUB-TOTALS this page				
TOTALS—Carry forward to next page				

DATE	TOTAL TIME IN SERVICE	TOTAL TIME SINCE OVERHAUL	TACH OR RECORDING METER TIME	DESCRIPTION OF WORK PERFORMED— SIGNATURE & CERTIFICATE NO. OF PERSON PERFORMING WORK
TOTALS brought forward from previous page				

Left Engine Logbook

02-11-2008 ACTT: 4990.7 LETT: 1534.3 RETT: 1657.5
 N31C Hobbs: 722.8 LETSO: 558.3 RETSO: 558.3
 TCM GTSIO-520-L LPTT: 558.3 RPTT: 558.3
 s/n: 808306 LPTSO: new RPTSO: new

Complied with AD2000-01-16 (Exhaust System, last revised 1/10/2000) part b by visual inspection – no defects noted, next due 5040.7 ACTT. Complied with AD2007-05-15 (Starter Drive, last revised 2/26/2007) part 2 back-lash by measurement inspection – measurements within limits .05, .04, .04, .03, next due 5090.7 ACTT. Removed and replaced oil and filter, cut filter open – on metal noted. Serviced engine with CH48111-1 oil filter and 12 quarts of Phillips 20w-50 oil. Ground ran, leak, and operational checks satisfactory. All Work performed in accordance with applicable manuals.

Wyat Hatz A&P2706256

Powerplant Logbook Insert**LEFT**

N31C

4-25-08 HOBBS TIME: 754.3 TOTAL TIME: 1565.8 SMOH: 589.8

REMOVED AND REPLACED RIGHT MAG WITH OVERHAULED P/N
 10-349260-7 S/N1033114. GROUND RUN LEAK CHECK GOOD. OK FOR
 RETURN TO SERVICE.

LESLIE A BLOUNT
 A&P 363502653

*Leslie A Blount***Left Engine Logbook**

05-28-2008 ACTT: 5041.4 LETT: 1585.0 RETT: 1708.2
 N31C Hobbs: 773.5 LETSO: 609.0 RETSO: 609.0
 TCM GTSIO-520-L LPTT: 609.0 RPTT: 609.0
 s/n: 808306 LPTSO: new RPTSO: new

Complied with AD2000-01-16 (Exhaust System, last revised 1/10/2000) part b by visual inspection – no defects noted, next due 5091.4 ACTT. Removed and replaced oil and filter, cut filter open – on metal noted. Serviced engine with CH48111-1 oil filter and 12 quarts of Phillips 20w-50 oil. Ground ran, leak, and operational checks satisfactory. All Work performed in accordance with applicable manuals.

Wyat Hatz A&P2706256

SUB-TOTALS this page

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DATE	TOTAL TIME IN SERVICE	TOTAL TIME SINCE OVERHAUL	TACH OR RECORDING METER TIME	DESCRIPTION OF WORK PERFORMED— SIGNATURE & CERTIFICATE NO. OF PERSON PERFORMING WORK	
				TOTALS brought forward from previous page	

**Powerplant Logbook Insert
LEFT**

N31C

7-17-08 HOBBS TIME: 777.8 TOTAL TIME: 1589.3 SMOH: 613.3
 C/W AD 2005-20-04 STARTER DRIVE ADAPTOR BACKLASH
 MEASURES .03 ON ALL FOUR POSITIONS. C/W AD 2000-01-16 BY
 REMOVING AND INSPECTION OF TAIL PIPE, FIRE WALL AND BEAMS
 AND PRESSURE CHECKING EXHAUST LAW PAR. B,C,D & E. CLEANED
 AND GAPPED PLUGS INSTALLED OVERHAULED LEFT MAG 10-349220-4R
 SERIAL NUMBER 1060153 AND CHECKED RIGHT MAG TIMEING AND
 CLEANED FUEL NOZZLES. COMPRESSION CHECK GOOD #1 74/80 #2
 74/80 #3 75/80 #4 74/80 #5 75/80 #6 75/80. GROUND RUN LEAK CHECK
 GOOD. I CERTIFY THAT THIS ENGINE WAS INSPECTED I/A/W AN
 ANNUAL 100HR INSPECTION AND FOUND TO BE IN AIRWORTHY
 CONDITION.

LESLIE A BLOUNT
 A&P 363502653

Leslie A Blount

Left Engine Logbook

11-03-2008

ACTT: 5081.3

LETT: 1624.9

RETT: 1748.1

N31C

Hobbs: 813.4

LETSO: 648.9

RETSO: 648.9

TCM GTSIO-520-L

LPTT: 648.9

RPTT: 648.9

s/n: 808306

LPTSO: new

RPTSO: new

Complied with AD2000-01-16 (Exhaust System, last revised 1/10/2000) part b by visual inspection – no defects noted, next due 5131.3 ACTT. Removed and replaced oil and filter, cut filter open – on metal noted. Serviced engine with CH48111-1 oil filter and 12 quarts of Phillips 20w-50 oil. Ground ran, leak, and operational checks satisfactory. All Work performed in accordance with applicable manuals.

Wyat Hatz A&P2706256

Airframe Log

01-16-2009

ACTT: 5106.5

I

N31C

Hobbs: 838.6

I

Cessna 421C

I

s/n: 421C0096

I

Removed and replaced both sets of prop de-ice t
 Work performed in accordance with applicable manu

Wyat Hatz A&P2706256

SUB-TOTALS this page

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ITEM: 4	PN: B40189	QTY: 1	DESG: BRUSH & HO	U/M: EA	ORDER: 2272886N/LOT: N/A
4	2272886	4	4	4	4
5	Cessna Aircraft Co and Address	5	Cessna Parts Distribution 5800 E Pawnee, Wichita, KS 67212	5	AUTHORIZE FAA/UNITED STATES FAA FORM 8130-1
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DAT	Left Engine Logbook				WORK
03-25-2009	ACTT: 5130.2	LETT: 1673.8	RETT: 1797.0		
N31C	Hobbs: 862.3	LETSO: 697.8	RETSO: 697.8		
TCM GTSIO-520-L		LPTT: 697.8	RPTT: 697.8		
s/n: 808306		LPTSO: new	RPTSO: new		
Complied with AD2000-01-16 (Exhaust System, last revised 1/10/2000) part b by visual inspection – no defects noted, next due 5180.2 ACTT. Complied with AD2007-05-15 (Starter Drive, last revised 2/26/2007) part 2 back-lash by measurement inspection – measurements within limits .03, .04, .04, .05, next due 5230.0 ACTT. Removed and replaced oil and filter, cut filter open – on metal noted. Serviced engine with CH48111-1 oil filter and 12 quarts of Phillips 20w-50 oil. Ground ran, leak, and operational checks satisfactory. All Work performed in accordance with applicable manuals.					
Wyat Hatz A&P2706256					

LT Engine Log

N31C 09/4/09 Hobbs 889.0 A/C TT: 5156.9 TSMOH: 724.5

Completed an Annual Inspection in accordance with Heartland Aviation annual inspection checklist. Changed oil and filter. Inspected old oil filter, no metal found, installed new CH48111-1 oil filter. Serviced with 12 qts of Phillips 20W50XC. Cleaned, gapped, tested, and reinstalled sparkplugs. Compression test results, #1 70/80 #2 71/80 #3 69/80 #4 67/80 #5 70/80 #6 69/80. Checked magneto timing. Cleaned and reinstalled fuel injectors. Complied with AD2007-05-15 Part 2 started adapter inspection measurements as follows .03, .04, .03, .04. Washed down engine, All AD'S and service bulletins complied with thru this date. AD's Checked thru this date. Run up and operational checks good. Leak checks good.

I certify that this Engine has been inspected in accordance with an Annual Inspection and is determined to be in Airworthy Condition. Work order # 12603

Heartland Aviation Inc.

3800 Starr Ave.

Eau Claire WI. 54703

Signed Certificate # IA3044442

Left Engine Logbook					
11-16-2009	ACTT: 5177.2	LETT: 1720.8	RETT: 1844.0		
N31C	Hobbs: 909.3	LETSO: 744.8	RETSO: 744.8		
TCM GTSIO-520-L		LPTT: 744.8	RPTT: 744.8		
s/n: 808306		LPTSO: new	RPTSO: new		
Complied with AD2000-01-16 (Exhaust System, last revised 1/10/2000) part b by visual inspection – no defects noted, next due 5227.2 ACTT. Removed and replaced oil and filter, cut filter open – on metal noted. Serviced engine with CH48111-1 oil filter and 12 quarts of Phillips 20w-50 oil. Ground ran, leak, and operational checks satisfactory. All Work performed in accordance with applicable manuals.					

Wyat Hatz A&P2706256 

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ENGINE MAINTENANCE RECORDS

Log No. 1

Aircraft Registration No. N31C

Engine Manufacturer Continental

Model GT510-520-L

Serial No. 292090-R

Date installed on aircraft 5-23-2013

Time Between Overhauls (TBO) _____ Hours

If used on multi-engine aircraft:

Right Left

DATE	TOTAL TIME IN SERVICE	TOTAL TIME SINCE OVERHAUL	TACH OR RECORDING METER TIME	DESCRIPTION OF WORK PERFORMED— SIGNATURE & CERTIFICATE NO. OF PERSON PERFORMING WORK
Date	Total Time In Service	Total Time Since Overhaul	Tach or Recording Meter Time	

RAM Aircraft, Limited Partnership • Waco Regional Airport



Continental GTSIO-520-L Left Engine S/N 292090-R

Above referenced engine overhauled to new parts limits per FAR 43.2(a)(1)(2) to conform w/TCM SM X-30045A. Applicable AD's and Service Bulletins C/W at this time. All gears cleaned, polished when required, inspected, magnafluxed, and no cracks found. Finish and dimensional limits within RAM Gear Inspection Specification No. 1818, Rev. K dated 2-08-2010. Above referenced engine modified per STC SE8338SW-D. Installed new RAM camshaft p/n 2621- 1, s/n XGB11017 as direct PMA replacement of Continental camshaft. Installed lifters p/n 658088 int. p/n 658077 exh. AD 10-11-04 n/a to lifter p/n installed. Installed new VAR crankshaft p/n 653020 s/n N12KA007. Ultrasonic inspection per MSB96-10A due at overhaul or when removed. AD 99-19-01 n/a per crankshaft date of manufacture I/A/W TCM MSB99-6A. Engine assembled with overhauled TCM heavy style crankcase p/n 654119-12, s/n J4A6324ORB. Installed new TCM nickel plated cylinders. Installed overhauled RAM/FAA/PMA fuel nozzles p/n 2563-19A. TCM Service Bulletin SB06-1A N/A per installation of RAM fuel nozzles. Installed new oil cooler p/n 8000464, s/n 3859362. Engine accessories exchanged for overhauled or new units with exception of tach generator, vacuum pump, prop governor and hydraulic pump which were not installed per this work order. Installed new Hartzell ALV 9610 alternator (weight 12.75 lbs.) This will require a weight and balance change. Bendix magnetos installed. MSB94-8D on magneto timing procedure c/w per timing to data plate TC degree requirements with TDC locator and protractor with pointer. Engine modified to GTSIO-520-L per Continental Service Bulletin M-75-6 Rev. 1. Installed rocker arms p/n 1654-2 (STC SE8338SW-D). Starter adapter shaftgear and crankshaft gear inspection, AD 2007-05-15 c/w per TCM Service Bulletin MSB94-4G per installation of Service Kit EQ6642 with bushing p/n 654472. Category 1 thru 3 TCM Service Bulletin Compliance Listing in RAM Manual. Relocated turbo oil supply line per RAM Dwg. No. 1224, Rev H, dated 11-18-03 per STC SE8338SW-D. AD 87-04-05 n/a per engine model. Installed RAM/FAA/PMA spring loaded induction clamps p/n 1170-1. Installed RAM-FAA-PMA rocker box cover gaskets p/n 1366-1. Engine ground run on test stand per RAM specifications for 4 hours. Engine run-in with Phillips 20W-50 Type M mineral oil. See RAM Recommended Oil Grade Maintenance Tip MT-1 for recommended oils. Engine approved for return to service for the work performed. Engine preserved per Service Bulletin SIL99-1 temp. storage up to 90 days. Pertinent details on file under Project No. 6726.

RAM Aircraft, Limited Partnership, P.O. Box 5219, Waco, Texas 76708, CRS VA1B551K

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N31C (Left Engine Logs)
TCM GTSIO 520L S/N 292090-R

Inspected engine as required by FAR91.409 (a) (1) per inspection checklist meeting requirements of FAR 43.15 (2)(c) and FAR 43 App. D. Performed post inspection operational checks per FAR43.15 (c)

Installed this engine in left side of N31C Cessna 421C0096.

Installed with new motor mounts and attach bolts., RAM provided accessories. Time continued vacuum pump, tach generator and prop governor from previous engine.

Installed new spark plugs and serviced with Aeroshell 100 Mineral.

Pre-oiled engine/turbo as per RAM instructions.

Engine test run and set up operations as required.

CW AD84-26-02 Effective Date - 01/29/85 Paper induction air filters CW by replacement of (left side only) filter due again in (500 hr. at hobbs 1611.1)

DATE 5/23/2013 HOBBS 1308.5 Engine Total time 4649.8 Engine TSMOVH "0"
**"I CERTIFY THAT THIS ENGINE HAS BEEN INSPECTED IN ACCORDANCE WITH AN ANNUAL INSPECTION AND
 WAS DETERMINED TO BE IN AIRWORTHY CONDITION."**

Anthony R. Saxton AP3253746IA



N31C (Left Engine Logs)
TCM GTSIO 520L S/N 292090-R

Changed oil and filter (Phillip X-C 20W50) .

Installed warranty replacement left side alternator FAA/PMA ALV-9610 s/n H-N030017.

Replaced left side vacuum pump with OVH unit #3P207JA s/n PE83228 returned to service by Accessories Inc. CRSTM2R192L w.o. #69298R.

DATE 6/14/2013 HOBBS 1334.7 Engine Total time 4676.0 Engine TSMOVH 26.2

Anthony R. Saxton AP3253746IA



N31C (Left Engine Logs)
TCM GTSIO 520L S/N 292090-R

Changed oil and filter (Phillip X-C 20W50) Collected Blackstone oil samples.

DATE 8/6/2013 HOBBS 1361.33 Engine Total time 4702.63 Engine TSMOVH 52.83

Anthony R. Saxton AP3253746IA



N31C (Left Engine Logs)
TCM GTSIO 520L S/N 292090-R

Changed oil and filter (Phillip X-C 20W50) Collected Blackstone oil samples.

DATE 9/17/2013 HOBBS 1396.3 Engine Total time 4737.6 Engine TSMOVH 87.8

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N31C (Left Engine Logs)
TCM GTSIO 520L S/N 292090-R

Changed oil and filter this date (Phillips X/C 20W50)

DATE 12/20/2013

HOBBS 1427.3

Engine Total time 4768.6

Engine TSMOVH 118.8

Anthony R. Saxton AP3253746IA



N31C (Left Engine Logs)
TCM GTSIO 520L S/N 292090-R

Changed oil and filter (Phillip X-C 20W50)

Reinstalled turbocharger # 465930-9003 s/n UER0104P following inspection by RAM Aircraft (CRS# VA1R551K) w.o. # 7158.02 for compliance with Hartzell Engine Technologies Alert Service Bulletin No. 057. Bulletin CW and affected back plate not installed.

DATE 3/18/2014

HOBBS 1491.4

Engine Total time 4832.7

Engine TSMOVH 182.9

Anthony R. Saxton AP3253746IA



N31C (Left Engine Logs)
TCM GTSIO 520L S/N 292090-R

Inspected engine as required by FAR91.409 (a) (1) per inspection checklist meeting requirements of FAR 43.15 (c)(2) and FAR 43 App. D. Performed post inspection operational checks per FAR43.15 (c)

Compression #1 74/80 #2 76/80 #3 74/80 #4 72/80 #5 72/80 #6 74/80

Current Compression and bore-scope Meets Require. of TCM SB03-3 Diff. Pressure Test 3/28/03. (Master Orifice reading Minimum 46 PSI)

Changed oil and filter (Phillip X-C 20W50) Completed oil analysis. (Blackstone)

Replaced all spark plugs with new Tempest URHB32E plugs. Cleaned and rescaled fuel injector nozzles.

CW AD2007-05-15 eff. 4/16/2007(Supersedes 2005-20-04) (GTSIO520 only) (TCM MSB94-4F) Starter adapter reoccurring inspection

(ii) 100 hr/ or annual Starter drive backlash inspection per MSB94-4F part 2 (max .06"). (.05, .05, .05, .05)

Inspection due at next 100 hr. or annual. (Hobbs 1408.5 or May 2014)

CW AD84-26-02 Effective Date - 01/29/85 Paper induction air filters CW by replacement off left side) filter due again in (500 hr. at hobbs 2045.1)

DATE 7/2/2014 HOBBS 1545.4 Engine Total time 4886.7 Engine TSMOVH 236.9

"I CERTIFY THAT THIS ENGINE HAS BEEN INSPECTED IN ACCORDANCE WITH AN ANNUAL INSPECTION AND
WAS DETERMINED TO BE IN AIRWORTHY CONDITION."

Anthony R. Saxton AP3253746IA



N31C (Left Engine Logs)
TCM GTSIO 520L S/N 292090-R

Changed oil and filter (Phillip X-C 20W50)

DATE 12/18/2014

HOBBS 1624.9

Engine Total time 4966.2

Engine TSMOVH 316.4

Anthony R. Saxton AP3253746IA

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N31C (Left Engine Log)
TCM GTSIO 520L S/N 292090-R

Found #6 fuel injector nozzle loose. Removed and inspected threads and gasket Cleared reinstalled and leak checked.

DATE 1/15/2015

HOBBS 1629.8

Anthony R. Saxton AP3253746IA

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N31C (Left Engine Log)
TCM GTSIO 520L S/N 292090-R

Changed oil and filter (Phillip X-C 20W50)

Replaced #2 EGT probe.

AD2007-05-15 eff. 4/16/2007(Supersedes 2005-20-04) (GTSIO520 only) (TCM MSB94-4F) Starter adapter reoccurring inspection

(h) 100 hr/ or annual Starter drive backlash inspection per MSB94-4F part 2 (max .06")
.040/.040/.040/.040

DATE 5/5/2015

HOBBS 1675.0

Engine Total time 5016.3

Engine TSMOVH 366.5

Anthony R. Saxton AP3253746IA

Anthony R. Saxton



N31C (Left Engine Log)
TCM GTSIO 520L S/N 292090-R

Inspected engine as required by FAR91.409 (a) (1) per inspection checklist meeting requirements of FAR 43.15 (c)(2) and FAR 43 App. D. Performed post inspection operational checks per FAR43.15 (e)

Compression #1 74/80 #2 74/80 #3 74/80 #4 70/80 #5 64/80 #6 78/80

Current Compression and bore-scope Meets Require. of TCM SB03-3 Diff. Pressure Test 3/28/03. (Master Orifice reading Minimum 46 PSI)

Changed oil and filter (Phillip X-C 20W50) Completed oil analysis. (Blackstone)

Cleaned and rotated spark plugs. Cleaned and reseal fuel injector nozzles.

Replaced left engine vacuum pump with OVH Pesco 3P207JA s/n PE18858 returned to service Accessories Inc. (CRS#TM2R192L) w.o.# 78395R. CW AD2007-05-15 eff. 4/16/2007(Supersedes 2005-20-04) (GTSIO520 only) (TCM MSB94-4F) Starter adapter reoccurring inspection

(h) 100 hr/ or annual Starter drive backlash inspection per MSB94-4F part 2 (max .06"). (.04, .03, .03, .04)

Inspection due at next 100 hr. or annual. (Hobbs 1785.3 or Aug 2016)

(j) 400 hr. Removal inspection per MSB94-4 part 3 and found OK Reinstalled. (Due again in 400 hr. at Hobbs 2085.3)

CW AD84-26-02 Effective Date - 01/29/85 Paper induction air filters CW by replacement off (left side) filter due again in (500 hr. at hobbs 2185.3)

DATE 8/17/2015

HOBBS 1685.3

Engine Total time 5026.6

Engine TSMOVH 376.8

"I CERTIFY THAT THIS ENGINE HAS BEEN INSPECTED IN ACCORDANCE WITH AN ANNUAL INSPECTION AND
WAS DETERMINED TO BE IN AIRWORTHY CONDITION."

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N31C (Left Engine Log)
TCM GTSIO 520L S/N 292090-R

Changed oil and filter (Phillip X-C 20W50)

DATE 5/11/2016

HOBBS 1792.4

Engine Total time 5133.7

Engine TSMOVH 483.9

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N31C (Left Engine Logs)

TCM GTSIO 520L S/N 292090-R

Inspected engine per 100 hr. checklist meeting requirements of FAR 43 App. D. in conjunction with Annual Inspection on Cessna 421C, s/n 421C0096 this date. Performed post inspection operational checks per FAR43.15 (c)

Compression #1 70/80 #2 64/80 #3 74/80 #4 70/80 #5 62/80 #6 74/80

Current Compression and bore-scope Meets Requirements of TCM SB03-3 Diff. Pressure Test 3/28/03. (Master Orifice reading Minimum 46 PSD)

Changed oil and filter (Phillip X-C 20W50) Completed oil analysis. (Blackstone)

Cleaned and rotated spark plugs. Cleaned and reseal fuel injector nozzles.

CW AD2007-05-15 eff 4/16/2007 (Supersedes 2005-20-04) (GTIS520 only) (TCM MSB94-4E) Starter adapter reoccurring inspection

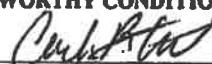
(b) 100 hr. or annual Starter drive backlash inspection per MSR94-4E part 2 (max .06") (02 02 01 02)

Inspection due at next 100 hr. or annual. (Hobbs 1950.0 or Sept 2017)

DATE 9/20/16 HOPES 1860.0 Engine Total time 5101.2 Eng. - ESM00115412

DATE 9/19/2016 HOBBS 1850.0 Engine Total time 5191.3 Engine TSMOVH 541.8
"I CERTIFY THAT THIS ENGINE HAS BEEN INSPECTED IN ACCORDANCE WITH A 100 Hr. INSPECTION AND
WAS DETERMINED TO BE IN AIRWORTHY CONDITION."

Anthony R. Saxton AP32537461A



**N31C (Left Engine Logs)
TCM GTS10 520L S/N 292090-R**

Changed oil and filter (Phillip X-C 20W50)

DATE 1/09/2017

HOBBS 1862.2 **Engine Total time 5203.5**

Engine TSMQVH 553.7

Anthony R. Saxton AP32537461A

glae Total time 5203.5

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Date	Total Time In Service	Total Time Since Overhaul	Tach or Recording Meter Time
5/11/17	5227.3	577.5	1886.0



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CONTINENTAL GTSIO-520-L Left Engine S/N 292090-R

The above referenced engine was disassembled to facilitate a case change. The engine was cleaned, inspected and reassembled to service limits per CMI Standard Practice Maintenance Manual M-O and CMI Overhaul Manual X-30045. Reused crankshaft, prop shaft, reduction gear, quill shaft, camshaft and lifters. Installed new crankcase S/N R16HA222, prop shaft bearings, reduction gear bearings, main and rod bearings. C/W MSB96-10B ultrasonic inspection. AD 2007-05-15 c/w per MSB94-4H or latest revision, Part 3. Next 100 hour inspection due 1986.0. Next 400 hour inspection due 2286.0. Rods balanced to RAM specifications and new bolts and nuts installed in rods. Reinstalled cylinder assemblies. Installed overhauled oil pump S/N 802020 and new alternator S/N H-R022618. Installed accessories in their respective positions with existing time in service with the exception of the vacuum pump, tach generator, and hydraulic pump which not installed per this work order. Cleaned and flushed prop governor, oil cooler, lifters, and starter adapter. Serviced engine with Aeroshell 100 oil. Run in test cell for 1 hour. Engine is approved for return to service for work performed. Engine preserved per CMI M-O Standard Practice Maintenance Manual temp. storage up to 90 days. Pertinent details on file under Project No. 8383.

Starkweather
RAM Aircraft, Limited Partnership, P. O. Box 5219, Waco, Texas 76708 CRS VA1R551K



Twin Cessna Specialists

N31C (Aircraft Logs)
Cessna 421C s/n 421C0096

Reinstalled left engine (GTSIO520L s/n 292090-R) following repair (for cracked case) and return to service by RAM Aircraft (CRS#VA1R5 #8383).

Reinstalled prop per McCauley Propeller Systems Manual MPC-26 section 61-xx-xx.

Performed post inspection operational checks per FAR43.15 (c).

C/W AD2008-01-16 Effective Date Feb 15, 2000 (Supersedes AD75-23-08R5) Exhaust system inspection.

C/W Para (b) exhaust visual inspection.) LEFT

(LEFT engine Inspection due again in 50 hr. at Hobbs 1936.0

Eng 11 5227.3 Eng TSMO VH 577.5

DATE 5/25/2017 HOBBS 1886.0 AIRCRAFT TOTAL TIME 6188.0

Anthony R. Saxton AP3253746IA *Anthony R. Saxton*



N31C (Left Engine Logs)
TCM GTSIO 520L S/N 292090-R

Changed oil and filter (Phillip X-C 20W50)

DATE 8/23/2017 HOBBS 1911.9 Engine Total time 5253.2 Engine TSMO VH 603.4

Anthony R. Saxton AP3253746IA *Anthony R. Saxton*

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N31C (Left Engine Logs)
TCM GTSIO 520L S/N 292090-R

Inspected engine per 100 hr. checklist meeting requirements of FAR 43 App. D. in conjunction with Annual Inspection on Cessna 421C, s/n 421C0096 this date. Performed post inspection operational checks per FAR43.15 (c)

Compression #1 68/80 #2 69/80 #3 72/80 #4 68/80 #5 48/80 (rings, scope OK). #6 78/80

Current Compression and bore-scope Meets Require. of TCM SB03-3 Diff. Pressure Test 3/28/03. (Master Orifice reading Minimum 46 PSI)

Changed oil and filter (Phillip X-C 20W50) Completed oil analysis. (Blackstone)

Cleaned and rotated spark plugs. Cleaned and reseal fuel injector nozzles. Repaired broken fuel divider vent line. Replaced TIT probe with new M111-T

CW Mag 500 hr. inspection per TCM SB643B Maintenance Interval for all TCM & Bendix mags per Para 3 A.

(Disassembled inspected, cleaned, reset E gaps, Reassembled and retimed to engine (New parts as follows)

Left mag: points AB382585, : points AB382584

Right mag, points AB382585

CW Magneto timing per Continental M-O manual section 6-4.9.1 (superseded MSB94-8D) Magneto to Engine Timing (Continental)

CW AD2007-05-15 eff. 4/16/2007(Supersedes 2005-20-04) (GTSIO520 only) (TCM MSB94-4F)Starter adapter reoccurring inspection

(h) 100 hr/ or annual Starter drive backlash inspection per MSB94-4F part 2 (max .06"). (.03, .03, .02, .04)

Inspection due at next 100 hr. or annual. (Hobbs 1950.0 or Sept 2017)

DATE 10/4/2017 **HOBBS** 1914.6 **Engine Total time** 5290.0 **Engine TSMOVH** 640.5

**"I CERTIFY THAT THIS ENGINE HAS BEEN INSPECTED IN ACCORDANCE WITH A 100 Hr. INSPECTION AND
WAS DETERMINED TO BE IN AIRWORTHY CONDITION."**

Anthony R. Saxton AP3253746IA



N31C (Left Engine Logs)
TCM GTSIO 520L S/N 292090-R

Changed oil and filter (Phillip X-C 20W50)

DATE 4/10/2018 **HOBBS** 1952.8 **Engine Total time** 5294.1 **Engine TSMOVH** 644.3

Anthony R. Saxton AP3253746IA



N31C (Left Engine Logs)
TCM GTSIO 520L S/N 292090-R

Changed oil and filter (Phillip X-C 20W50)

DATE 6/12/2018 **HOBBS** 1997.3 **Engine Total time** 5338.6 **Engine TSMOVH** 688.8

Anthony R. Saxton AP3253746IA

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DATE	TOTAL TIME IN SERVICE	TOTAL TIME SINCE OVERHAUL	TACH OR RECORDING METER TIME	DESCRIPTION OF WORK PERFORMED— SIGNATURE & CERTIFICATE NO. OF PERSON PERFORMING WORK
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N31C (Left Engine Logs)

TCM GTSIO 520L S/N 292090-R

Inspected engine per 100 hr. checklist meeting requirements of FAR 43 App. D. in conjunction with Annual Inspection on Cessna 421C, s/n 421C0096 this date. Performed post inspection operational checks per FAR43.15 (c)
Changed oil and filter (Phillip X-C 20W50) Completed oil analysis. (Blackstone)
Compression #1 68/80 #2 62/80 #3 60/80 #4 60/80 #5 48/80 (rings, scope OK). #6 67/80
Current Compression Requirements of CMI M-O Manual section 6-4.11.2.4 Diff. Press.Test (Master Orifice reading Minimum 46 PSI)
Borescope insp. per CMI M-O Manual section 6-4.11.3.
Cleaned and gapped spark plugs per CMI M-O Manual section 6-4.9.2 Replaced 6 plugs with new URHB32E Plugs.
CW Magneto timing per Continental M-O manual section 6-4.9.1 (supersedes MSB94-8D) Magneto to Engine Timing (Continental)
Cleaned and resealed injector nozzles per CMI M-O Manual section 6-4.17
Replaced oil pump outlet crush gasket #MS35769-48
Replaced left engine inboard exhaust riser assy with new Knisley Welding assy. K9910295-16 s/n 269010
Replaced starter Oring with new MS9021-038.
CW AD2007-05-15 eff. 4/16/2007(Supersedes 2005-20-04) (GTSIO520 only) (TCM MSB94-4F)Starter adapter reoccurring inspection
(b) 100 hr/ or annual Starter drive backlash inspection per MSB94-4F part 2 (max .06"). (.04, .03, .04, .04)
Inspection due at next 100 hr, or annual. (Hobbs 2121.0 or March 2020)

DATE 3/28/2019 HOBBS 2021.0 / Acft TT 6323.0 Engine TSMOVH 746.9

The engine identified was repaired and/or serviced in accordance with current Federal Aviation Administration regulations and is hereby approved for return to service with respect to work performed.

**"I CERTIFY THAT THIS ENGINE HAS BEEN INSPECTED IN ACCORDANCE WITH A 100 Hr. INSPECTION AND
WAS DETERMINED TO BE IN AIRWORTHY CONDITION."**



Anthony R. Saxton AP32537461A

the 8th inst

N31C (Left Engine Logs)

TCM GTS10 520L S/N 292090-R

Replaced oil pump outlet fitting with serviceable unit and new gasket. Replaced breather flex line from firewall to turbo.

DATE 4/8/2019 **HOBBS 2031.4 / Acft TT 6333.4** **Engine TSMOVH 757.3**
The engine identified was repaired and/or serviced in accordance with current Federal Aviation Administration regulations and is hereby approved for return to service with respect to work performed.



Anthony R. Saxton AP32537461A

ct to work performed.

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