

RAM AIRCRAFT
The Engine Specialist
FOR CESSNA, BEECHCRAFT, & CIRRUS AIRCRAFT



ENGINE MAINTENANCE RECORDS

Aircraft Registration _____

Engine Position Right

Engine Serial No. 514389

7505 Karl May Dr. | P.O. Box 5219 | Waco Regional Airport | Waco, TX 76708 | Phone: (254) 752-8381 | Fax: (254) 752-3307 | www.ramaircraft.com



ENGINE MAINTENANCE RECORDS

Log No. _____

Aircraft Registration No. _____

Engine Manufacturer Continental

Model T510-520-NB

Serial No. 514389

Date installed on aircraft _____

Time Between Overhauls (TBO) 1600 Hours

If used on multi-engine aircraft:

☒ Right

☐ Left

Waco Regional Airport
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Page No. _____				
DATE	TOTAL TIME IN SERVICE	TOTAL TIME SINCE OVERHAUL	TACH OR RECORDING METER TIME	DESCRIPTION OF WORK PERFORMED— SIGNATURE & CERTIFICATION NO. OF PERSON PERFORMING WORK

Date	Total Time In Service	Total Time Since Overhaul	Recording Meter Time
9/11/17	6916.8	0.0	



RAM Aircraft, Limited Partnership • Waco Regional Airport

CONTINENTAL TSIO-520-NB Series IV Right Engine S/N 514389

Above referenced engine overhauled to new parts limits per FAR 43.2(a)(1)(2) to conform w/CMI SM X-30574 and Continental M-O, Standard Practice Maintenance Manual. Applicable AD's and Service Bulletins C/W at this time. All dimensional limits within RAM Gear Inspection Specification No. 1818, Rev. P dated 07/19/2017. Above referenced engine modified to TSIO-520-NB 325 HP per STC SE4327SW-D Rev.4. Installed new RAM camshaft p/n 1058-1A, s/n XJ16074 per STC SE4327SW-D. Installed lifters p/n SA628488 int., p/n SA646277 exh. AD 10-11-04 n/a to lifter p/n installed. AD 97-26-17 c/w per installation of overhauled VAR crankshaft p/n 649898, s/n N00KA031 per TCM CSB96-8. C/W ultrasonic inspection per MSB96-10B, due at next overhaul or when crankshaft removed. AD 99-19-01 n/a per crankshaft date of manufacture I/A/W TCM MSB99-3C. AD 2000-23-21 N/A to crankshaft serial number/date of manufacture I/A/W TCM Mandatory Service Bulletin MSB00-5D. Engine assembled with overhauled Continental heavy style crankcase p/n 654128-1, s/n C49808R Installed new Superior Steel cylinders. Installed overhauled oil cooler p/n 636900, s/n 577. C/W AD 89-24-01 R1 per installation of starter adapter p/n 642085A4 with current scavenge pump gears. AD 2012-10-13 and MSB11-4B Starter Adapter inspection. N/A per p/n installed. Installed .030 inch undersize starter adapter spring p/n S539800M30 per STC SE09846SC. Installed new RAM/FAA/PMA fuel nozzles p/n 2562-14D. TCM Service Bulletin SB06-1A N/A per installation of RAM fuel nozzles. Installed modified connecting rods p/n 1162 per STC SE4327SW-D as FAA-PMA approved replacement. Engine accessories exchanged for overhauled or new units with exception of prop governor, alternator, vacuum pump, hydraulic pump and tach generator which were not installed per this work order. New Slick pressurized magnetos p/n 6320 installed per STC SE4651SW-D and pressurized. Service Bulletin SB3-08A N/A to magneto serial numbers installed. SB1-12 Slick Points assy. N/A per S/N. MSB94-8D on magneto timing procedure c/w per timing to STC degree requirements with TDC locator and protractor with pointer. P/N 652130 & 652131 rocker arms installed. Installed RAM FAA-PMA oil cooler baffle p/n 1253-1, rocker arm cover gaskets p/n 1387-1, spring loaded induction clamps p/n 1170-2 and double clamp p/n 1170-5. Category 1 thru 3 CMI Service Bulletin Compliance Listing in RAM Manual. Engine ground run on test stand per RAM specifications for 3 hours. Engine run-in with Aeroshell 100 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 Continental M-O, Standard Practice Maintenance Manual temp. storage up to 90 days. Pertinent details on file under Project No 8530.

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

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				TOTALS—Carry forward to next page

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

DEER HORN AVIATION, LTD.October 18, 2017

N414LA Cessna 414A S/N: 414A-0077

Acft HM: 1817.7 ACFT TT: 8237.7

RT ENGINE TCM TSIO-520-NB S/N: 514389

Engine SMOH: 00.0 Engine TT: 6916.8

1. Complied with an annual inspection IAW FAR 43 appendix D and referencing the Cessna service manual 414/414A inspection - Time Limits guide (change 29).
2. Installed overhauled Engine S/N: 514389.
3. Serviced engine with Aeroshell 100 mineral oil
4. Complied with AD 2000-01-16, eff. /date 2-15-00, exhaust inspection, C/W para (b), (c), (e) and (g). Next Due: (b)- 30 days or 50 hrs. TIS whichever is later, (c) - 12 months, (e) - 12 months, (g) 12 yrs. or 2500 hrs TIS.
5. Setup fuel system per Ram requirements

I Certify that this engine has been inspected IAW a 100 Hr. inspection and was determined to be in an airworthy condition. Pertinent details of the work accomplished on this aircraft are on file at this agency under work order number M414LA03.

Jared L. Anderson

AP3159154IA

DEER HORN AVIATION, LTD.June 14, 2018

N414LA Cessna 414A S/N: 414A-0077

Acft TT: 8286.7 Acft HM: 1866.7

RT Engine TCM TSIO-520-NB S/N: 514389

Eng. SMOH: 0049.0

1. Complied with AD 2000-01-16, eff/rev date 2-15-2000, exhaust system inspection IAW figure 1 (b). Next Due in--50 hrs TIS or 30 days whichever is later.
2. Changed oil and oil filter. Serviced engine with 11 quarts Phillips 20W50 XC and a CH48108-1 oil filter. Engines were ground ran and leak checked with all indications normal.

This Engine is approved for return to service for the work performed. Pertinent details of the work accomplished on this aircraft are on file at this agency under work order number M414LA062018.

Darrian Sanchez

AP3900530

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Oil Recommendations

Mineral Oil & Mineral Based Oils

Break-in procedures: RAM uses Mineral Oil.

Normal operations: RAM uses Mineral Based Ashless Dispersant (AD) oils.

Ashless Dispersant (AD) Oil

Ashless Dispersant Oil could be written as Ashless and Dispersant Oil. There are two distinct features to remember about AD oil. Ashless stems from a requirement to clarify that the oil does not leave behind any ashes, or burning embers as it cleans. Decades ago in aviation history, oils that cleaned involved metallic cleaning particles that left embers. Such glowing metallic embers contributed to preignition. Detergent oils have long since been removed from aviation piston engines. Aviation oils that clean are required to be Ashless. When an oil has Dispersant qualities, the particles created and removed by cleaning are suspended (dispersed) within the oil. Being dispersed, they are collected better by the oil filter. During the initial engine break-in period, RAM believes that AD cleansing is premature. RAM recommends a non dispersant Mineral Oil during the initial twenty-five hour break-in period of an aircraft piston engine, or replacement cylinder.

Break-in Oil

The use of break-in oil and performing break-in procedures should be followed whether replacing one cylinder or six. For direct drive and geared engines, Mineral Oil such as SAE 50 AeroShell Oil 100 should be used. This procedure should be followed for the first twenty-five hours of operation (and can continue to as much as 100 hours depending on the cylinder bore material used). The oil should be changed as soon as oil consumption stabilizes, but no later than the first twenty-five hours of operation. At that time, oil should be changed to an Ashless Dispersant (AD) Mineral Based Oil.

Single Viscosity – Mineral Based AD Oil

RAM recommends Single Viscosity Mineral Based (AD) Oils such as: AeroShell W100 and W100 Plus Anti-wear (SAE 50 wt.) when typical ground level engine starting temperatures are not less than 40° F. When operating in colder environments AeroShell W80 or W80 Plus Anti-wear (SAE 40 wt.) and, of course preheating is recommended. [RAM service history records indicate that Mineral Based AD oils perform significantly better than synthetic and semi-synthetic oils.]



**RAM
RECOMMENDS**

Multi-Viscosity – Mineral Based AD Oil

Differing operating conditions and / or availability may warrant the use of multi-viscosity oils. Most important to RAM is that the oil be mineral based. RAM recommends a multi-viscosity ashless dispersant mineral based oil such as Phillips 66 X/C 20W-50. [RAM service history records indicate that Mineral Based AD oils perform significantly better than synthetic and semi-synthetic oils.]

Preheat

Preheat is recommended when engine starting temperatures are below 40° F. Preheat equipment can be purchased through numerous aviation supply companies, as well as through RAM's Parts Catalog.

Oil & Filter Change

RAM recommends changing the oil and filter every 50 hours or 4 months whichever occurs first. More frequent oil changes are encouraged.

Two major reasons for frequent oil changes are:

- (1) Flush out metal particles.
- (2) Flush out acid contamination.

Frequent Oil Changes

• Flush out metal particles

Both Lycoming and Continental Motors (CMI) engines include parts that have a proven history of normal wear that deposits normal wear particles of metal into the oil. Oil filters contribute significantly to capturing these wear particles, but not as effectively as frequently changing the oil.

• Flush out acid contamination

With four-cycle gasoline engines it is an unavoidable fact that acids collect in the oil. Acids are formed when combustion by-products and unburned gasoline leak past (blow-by) the piston rings into the crankcase. Acids are corrosive. They cause rust as well as pitting of lifter faces. Acids are not removed by oil filters or by changing filters. The only way to remove acids is to remove the oil that has become acid contaminated.

Oil Viscosity

Points made are well taken on both sides of the issue of whether to use single or multi grade oils. In the final analysis, you know that your aircraft is subjected to extreme temperature variations and starting conditions. Many aircraft fly frequently. Many aircraft don't fly enough. Successes and lack of successes, suggests there is simply not one viscosity that is always the best for all flight environments. In general RAM sees the following:

- Multi-Viscosity Mineral Based (AD) oil performs well in high usage airplanes.
- Single Viscosity Mineral Based (AD) oil performs well in high or low usage airplanes.

Synthetic & Semi-synthetic vs. Mineral Based Oil

RAM service history records are much less favorable for engines that have a history of being operated on synthetic blends or semi-synthetic oil products. RAM encourages using Mineral Based (AD) Oils only, single or multi-viscosity as conditions require.

