

N521RM

1977 Cessna 421C

RH Engine

Logbook

SMOH

2024

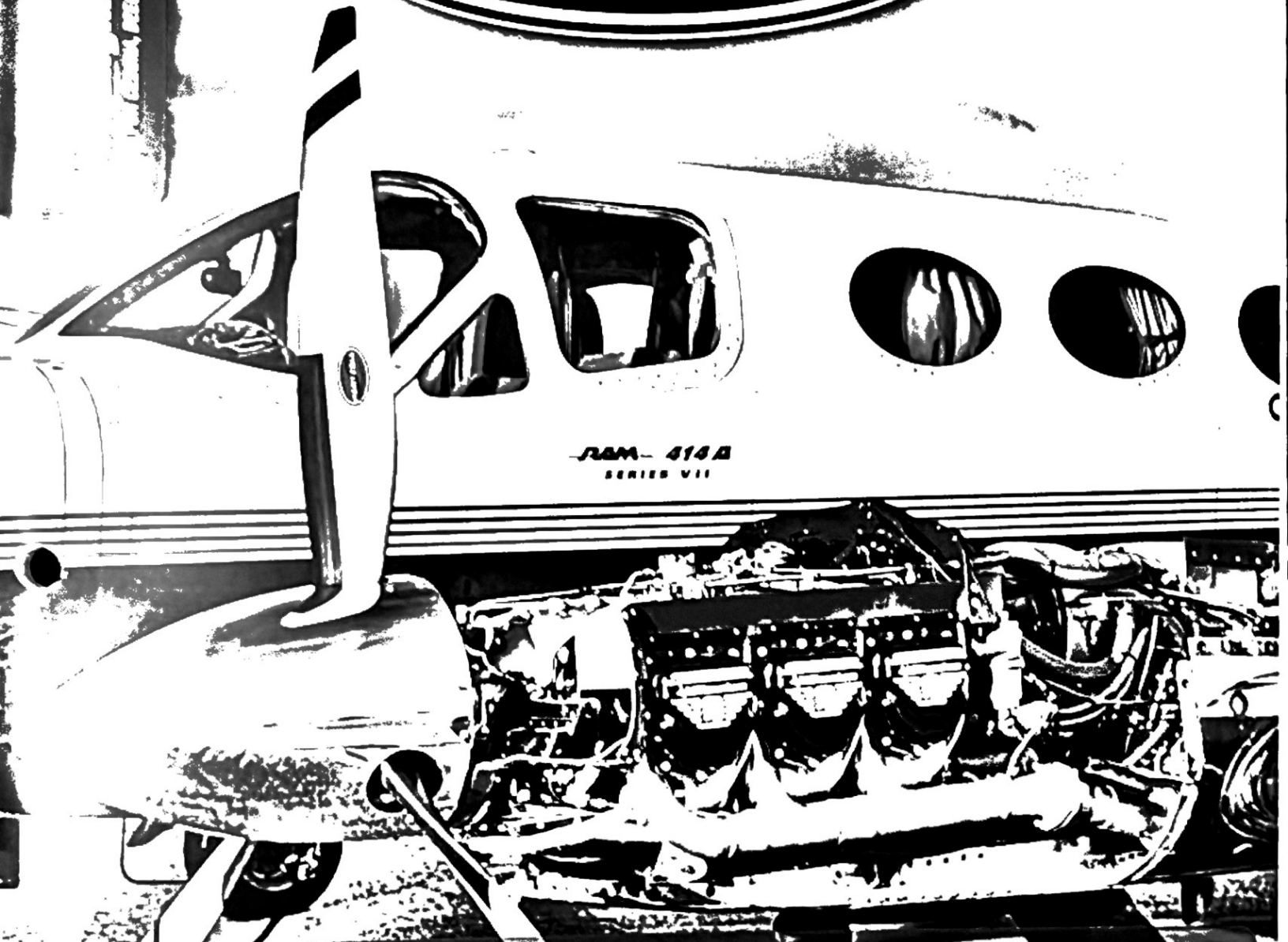
MSN: 421C-0335



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ENGINE MAINTENANCE RECORDS

Aircraft Registration N521RM
Engine Position Right
Engine Serial No. 292177-R



ENGINE MAINTENANCE RECORDS

Log No. _____

Aircraft Registration No. _____

Engine Manufacturer Continental

Model GTS10-520-L

Serial No. 292177-R

Date installed on aircraft _____

Time Between Overhauls (TBO) 1600 Hours

If used on multi-engine aircraft:

Right

Left

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

| 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 |

| Date | Total Time In Service | Total Time Since Overhaul | Recording Meter Time |
|------------|-----------------------|---------------------------|----------------------|
| 05-28-2024 | 493.3 | 0.0 | |



RAM Aircraft, Limited Partnership • Waco Regional Airport

CONTINENTAL GTSIO-520-L Right Engine S/N 292177-R

Above referenced engine overhauled to new parts limits per FAR 43.2(a)(1)(2) to conform with CAT OH Manual X-30045 and M-0, Standard Practice Maintenance Manual. Applicable AD's and Service Bulletins complied with at this time. All gears cleaned, polished when required, inspected, magnetic particle inspected, and no cracks found. Finish and dimensional limits within RAM Gear Inspection Specification No. 1818, Rev. P, dated 07/19/2017. Above referenced engine modified per STC SE8338SW-D. Installed new RAM camshaft, P/N 2621-2, S/N XGG21064, as direct PMA replacement of Continental camshaft. Installed new lifters, P/N SA628488 (INT) and P/N SA646277 (EXH). AD 10-11-04 N/A to lifter P/N installed. Installed overhauled VAR crankshaft, P/N 653020, S/N H109907N. Complied with ultrasonic inspection per MSB96-10B, due at next overhaul or when removed. CAT GTSIO-520 series engine crankshaft counterweights, P/N 652833-OH, are repaired in accordance with FAA approved procedures per RAM Drawing 2618, Rev. B, dated 10-21-05. Instructions for Continued Airworthiness: Remove P/N 652833-OH counterweights at next engine overhaul and replace with new per CAT Continental M-0, Standard Practice Maintenance Manual, except if repaired by RAM Aircraft, Limited Partnership per latest FAA approved revision of RAM Drawing 2618. Contact RAM Aircraft, L.P. at 7505 Karl May Drive, Waco, TX 76708, or (254) 752-8381 for replacement parts or service difficulties. AD 99-19-01 N/A per crankshaft date of manufacture in accordance with CAT MSB99-6B. AD 2023-05-16 N/A to crankshaft serial number/date of manufacture in accordance with CAT MSB23-01A. Engine assembled with new CAT heavy style crankcase, P/N 656935-12, S/N S24CA517. Installed new CAT steel cylinders. CAT SB18-08B N/A per cylinder S/N. Installed new RAM/FAA/PMA fuel nozzles P/N 2563-19A. CAT Service Bulletin SB06-1A N/A per installation of RAM fuel nozzles. Installed overhauled oil cooler, P/N 646685, S/N C12-10114-23. Engine accessories exchanged for overhauled or new units, with exception of prop governor, vacuum pump, hydraulic pump, and tach generator, which were not installed per this work order. Installed new Plane Power C28-150 alternator (weight 13.0 lbs.), S/N H-Y030011. This may require a weight and balance change. Installed new alternator drive coupling, P/N 646655, S/N C04031524. Overhauled Bendix magnetos installed per STC SE4591SW-D and pressurized. See 337. Magnetos timed to Type Certificate Data Sheet degree requirements with TDC locator and protractor with pointer per Continental M-0. Installed CAT overhauled rocker arms P/N 652966. Starter adapter shaftgear and crankshaft gear inspection, AD 2007-05-15 complied with per CAT Service Bulletin MSB94-4H Part 5 per installation of Service Kit EQ6642. Visual inspection of crankshaft gear and starter adapter shaft-gear due per Part 3 in 400 flight hours. Category 1 to 3 CAT 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. 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 CAT specifications for 90 minutes. 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-0, Standard Practice Maintenance Manual, and temporary storage up to 90 days. Pertinent details on file under Project No. 10950.

Eric Bonnell

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

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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.

