RAM AIRCRAFT, LP

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Oil Recommendations

Mineral Oil and 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 pre-ignition. 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 engines, Mineral Oil such as SAE 20W-50 Phillips Type-M should be used, and for geared engines, RAM prefers AeroShell Straight Weight Mineral Oil to 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.

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Single Viscosity - Mineral Based AD Oil

RAM recommends Single Viscosity Mineral Based (AD) Oils such as: Aeroshell W100 and W100 Plus Antiwear (SAE 50 wt.) when typical ground level engine starting temperatures are not less than 40° F. When operating in colder enviroments Aeroshell W80 or W80 Plus Antiwear (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.]

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 40º F. Preheat equipment can be purchased through numerous aviation supply companies, as well as through RAM's Parts Catalog.

Oil and Filter Change

RAM recommends changing the oil every 25 hours or 4 months whichever occurs first. RAM prefers an oil filter change at each 25 hour oil change interval but certainly you should not exceed 50 hours before changing your filter.

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 Teledyne Continental Motors (TCM) 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 mulit 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 and Semi-Synthetic Oil ***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.

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