

# SERVICE INSTRUCTION

DATE May 22, 1995

Service Instruction No. 1014M  
(Supersedes Service Instruction No. 1014L)  
Engineering Aspects are  
FAA Approved

SUBJECT: Lubricating Oil Recommendations

MODELS AFFECTED: All Textron Lycoming opposed series aircraft engines.

TIME OF COMPLIANCE: When preservation oil is removed after initial 25 hours, or when lubricating oil is changed or added.

Textron Lycoming Specification No. 301F approves for use lubricating oils which conform to both MIL-L-6082 or SAEJ1966 straight mineral type and MIL-L-22851 or SAEJ1899 ashless dispersant type lubricants for aircraft engines. Any brand name lubricating oil in accordance with these specifications is acceptable for use; proof of such conformity is the responsibility of the lubricating oil manufacturer.

## PART I - LUBRICATING OIL RECOMMENDATIONS

Average Ambient Air Temperature (NOTE A)	MIL-L-6082 or SAEJ1966 Spec. Mineral Grades (NOTE B)	MIL-L-22851 or SAEJ1899 Spec. Ashless Dispersant Grades (NOTE C)
All Temperature		SAE15W50 or SAE20W50
Above 80°F.	SAE60	SAE60
Above 60°F.	SAE50	SAE40 or SAE50
30°F. to 90°F.	SAE40	SAE40
0°F. to 70°F.	SAE30	SAE30, SAE40 or SAE20W40
0°F. to 90°F.	SAE20W50	SAE20W50 or SAE15W50
Below 10°F.	SAE20	SAE30 or SAE20W30

A. AVERAGE TEMPERATURES - The ambient ground air temperatures listed in the chart are meant only as a guide. Actually a great deal of personal judgement must be used when selecting the seasonal grade of oil to put into the engines. For example, if an aircraft is to be flown into an area which is much warmer or colder, only personal judgement on the part of the operator can determine what grade oil to use. When oil inlet temperatures approach the maximum allowable during operation, it is a good indication that a higher viscosity oil should be considered.



B. MINERAL GRADES - Included in this classification are aviation-grade, mineral lubricating oils. The SAE straight mineral grades, 20,30,40,50 and 60, shown in the chart, are the equivalent to Commercial Grades 55,65,80,100 and 120, and to Military Grades 1040,1065,1080,1100 and 1120 respectively. This classification also includes a multiviscosity 20W50 oil.

C. ASHLESS DISPERSANT GRADES - This classification contains additives, one of which has a viscosity stabilizing effect, which removes the tendency of the oil to thin out at high oil temperatures and thicken at low oil temperatures. The additives in these oils extend operating temperature range, improve cold engine starting and lubrication of the engine during the critical warm-up period, thus permitting flight through wider ranges of climatic changes without the necessity of changing oil. The ashless dispersant grades are recommended for aircraft engines subjected to wide variations of ambient temperature particularly the turbocharged series engines which requires oil to activate the various turbo controllers. The SAE Grades 30,40,50 and 60 shown on the chart are equivalent to grades of 65, 80,100 and 120 respectively. It must not be presumed however, that these oils will alleviate all of the problems encountered in extremely cold environments (below +10°F.). At these temperatures preheating of the engine and oil supply tank will be required regardless of the type of oil used.

## **PART II - OIL RECOMMENDATIONS FOR ENGINE OPERATION AND BREAK-IN**

A. All turbocharged engines must be broken-in and operated with ashless dispersant oil only.

B. O-320-H; O/LO-360-E series engines may be operated using either straight mineral oil or ashless oil. However, if the engine is delivered with ashless dispersant oil, it must remain on ashless dispersant oil. The Textron Lycoming oil additive P/N LW-16702 must be added to the O-320-H and O/LO-360-E engines at airframe installation, and every 50 hours thereafter or at every oil change. This lubrication recommendation supersedes the lubrication recommendations in Service Instruction No. 1392.

### **NOTE**

If it is determined that a FAA approved lubricating oil being used contains, in the proper amount, an oil additive equivalent to LW-16702, the provisions of this Service Instruction are met.

C. In all IGSO-480 and IGSO-540 series engines equipped with Simmonds fuel injection systems, it is allowable to use SAE50 or SAE60 grade lubricant providing the engine oil pressure does not exceed the limits set forth in the Operator's Manual.

D. All other engines must be operated on mineral oil during the first 50 hours of operation, or until oil consumption has stabilized. LW-16702 additive may be used. If an ashless dispersant oil is used in a new engine, or a newly overhauled engine, high oil consumption might possibly be experienced. The additives in some of these ashless dispersant oils may retard the break-in of the piston rings and cylinder walls. This condition can be avoided by the use of mineral oil until normal oil consumption is obtained, then change to the ashless dispersant oil. Mineral oil must also be used following the replacement of one or more cylinders or until the oil consumption has stabilized.

CAUTION

AIRCRAFT MANUFACTURERS MAY ADD APPROVED PRESERVATIVE LUBRICATING OIL TO PROTECT NEW ENGINES FROM RUST AND CORROSION AT THE TIME THE AIRCRAFT LEAVES THE FACTORY. THIS PRESERVATIVE OIL MUST BE REMOVED AT END OF THE FIRST 25 HOURS OF OPERATION. WHEN ADDING OIL DURING THE PERIOD PRESERVATIVE OIL IS IN THE ENGINE, USE ONLY AVIATION GRADE STRAIGHT MINERAL OIL OR ASHLESS DISPERSANT OIL, AS REQUIRED, OF THE VISCOSITY DESIRED.

**PART III - RECOMMENDATIONS FOR CHANGING OIL**

In engines that have been operating on straight mineral oil for several hundred hours, a change to ashless dispersant oil should be made with a degree of caution as the cleaning action of some ashless dispersant oils will tend to loosen sludge deposits and cause plugged oil passages. When an engine has been operating on straight mineral oil, and is known to be in excessively dirty condition, the switch to ashless dispersant oil should be deferred until after the engine is overhauled.

When changing from straight mineral oil to ashless dispersant oil, the following precautionary steps should be taken:

1. Do not add ashless dispersant oil to straight mineral oil. Drain the straight mineral oil from the engine and fill with ashless dispersant oil.
2. Do not operate the engine longer than five hours before the first oil change.
3. Check all oil filters and screens for evidence of sludge or plugging. Change oil every ten hours if sludge conditions are evident. Repeat 10 hour checks until clean screen is noted, then change oil at recommended time intervals.

CAUTION

THE TERMS "DETERGENT, ADDITIVE, COMPOUNDED" AND "ASHLESS DISPERSANT" USED HEREIN ARE INTENDED TO REFER TO A CLASS OF AVIATION ENGINE LUBRICATING OILS TO WHICH CERTAIN SUBSTANCES HAVE BEEN ADDED, AT THE REFINERY, TO IMPROVE THEM FOR AIRCRAFT USE. THESE TERMS DO NOT REFER TO SUCH MINERALS COMMONLY KNOWN AS "TOP CYLINDER LUBRICANT", "DOPES", "CARBON REMOVER" WHICH ARE SOMETIMES ADDED TO FUEL OR OIL. THESE PRODUCTS MAY CAUSE DAMAGE TO THE ENGINE (PISTONS, RING STICKING, ETC.) AND THEIR PRESENCE IN AN ENGINE WILL VOID THE OWNER'S WARRANTY. UNDER NO CIRCUMSTANCES SHOULD AUTOMOTIVE OIL BE USED. THE USE OF AUTOMOTIVE LUBRICANTS IN TEXTRON LYCOMING ENGINES IS NOT RECOMMENDED BECAUSE ITS USE COULD CAUSE ENGINE FAILURE.

NOTE: Revision "M" revises Part II, steps A. and B.