

Advisory Wire

REFERENCE NO:	AW300-79-0324	INFORMATION TYPE:	Maintenance Operational
ATA:	79-20	EFFECTIVITY:	Challenger 300 (20003 – 20500) Challenger 350 (20501 – 20999)
SUBJECT:	AS907 Oil Pump		

1. REFERENCES:

1.0 AW300-72-295 - Engine In-Flight Shut Down

2. INTRODUCTION:

This Advisory Wire is to update customers on the causes of oil pump failures reported earlier in 2018.

3. DESCRIPTION:

The AS907-2-1A engine oil pump is a gerotor type pump composed of a series of pressure and scavenge stages. These are held together inside a housing with a compression spring to prevent relative movement of the stack.

After investigation of the events discussed in reference 1.0, the root cause of the oil pump PN 3038704-3 & -5 failures was determined to be insufficient spring loading on the oil pump stack. This insufficient loading allowed relative motion of the eccentric rings and wear plates, causing wear, leading to loss of side clearance and subsequent oil pump failure.

Further investigation revealed that this situation is affected by 3 factors – engine type, oil type and oil temperature. The AS907-2-1A engine runs at slightly higher speeds than that of the AS907-1-1A engine; hence slightly higher oil pressure. Eastman 2197 oil (Honeywell approved oil for use on the AS907 model engine) has a higher viscosity at low temperature than Mobil 254. At low temperature (less than 35 deg C), the higher viscosity causes higher oil pump internal pressure at takeoff power, which could overcome the spring force, allowing movement of the internal components and gradually cause the damage described above. This condition can be reduced by allowing the oil temperature to warm to 40 deg C before takeoff.

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An enhanced oil pump is being developed in which the lube section components have been redesigned to minimize the internal radial forces as the oil flows through the pump. The spring is the same design as the oil pump PN 3038704-5; however, it has been shimmed to increase minimum stack load as well as minimizing the tolerance on stack load. The modifications eliminate any relative motion of the internal components under all operating conditions.

The enhanced oil pump, PN 3038704-6, is targeted to be available in Q1 of 2019.

4. ACTION:

Operators should familiarize themselves with the conditions that can cause oil pump failures.