Duncan Intelligence

CF34 Oil Pressure 101

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In recent editions we have discussed nuisance oil leaks and some signs to watch for. I'd like to stay with the oil system a little while longer and talk about the importance of ECTM, Engine Condition Trim Monitoring.

Trend monitoring is so inexpensive with so little labor involved that it's always going to be in the operator's best interest. It is yet another chore for the flight crew members, but again it is an easy one.

The oil pressure indication is the difference between the direct output pressure of the oil pump and the scavenge pressure of B-sump. This task is accomplished for you by the oil pressure transmitter. B-sump is used because of the high operating temperatures. Unlike A-sump and C-sump carbon seals which receive pressurization air regulated down to 30 psi, B-sump is a pressure vessel and the carbon seals are pressurized by unregulated 7th stage compressor air. The internal pressure of the B-sump housing is regulated to a slightly lower pressure to prevent oil from leaking past the carbon seals. With the internal pressure being lower, the unregulated pressurization air is allowed to enter the housing. With the engine at lower speeds, much of the internal air is vented. At higher speeds, this vessel is under tremendous pressure. This pressure combined with the housing being surrounded by the combustion liner, puts an incredible amount of heat to the oil. A clogged oil jet will give an increase in oil pressure, starve a bearing of critical cooling and lubrication, and increase oil temperature. An engine just out of maintenance should have this trending done to establish new norms and at 100 hours have the oil filter changed. During the maintenance event the oil system may pick up some debris. Trending the oil pressure and temperature as well as oil consumption will warn you of a developing problem. A leaking B-sump may show up as a change in oil temperature and/or oil pressure, as well as an increase in consumption. Some signs to look for would be those previously mentioned; no visible wetness in the exhaust duct, coked oil and/or wet oil around the B-sump supply and scavenge heads, or even around some of the openings on the combustion case blankets. Coking and wetness on the outside of the engine may just be packings on the B-sump strut tubes that get hard and brittle after time. This can be corrected on-wing in most cases. Oil that may show up out of the combustion drain after the engine has sat for an extended amount of time may be just hard and brittle packings on the #4 or #5 carbon seal housings. If it is the #5 carbon seal, this can also be corrected on-wing.

Any oil system problem can cause many of the symptoms mentioned and any one of those can cause a serious condition. Flight crews need to include ECTM as part of their duties, as well as being aware of what is the norm. Then with the trend information, the flight crew needs to keep the mechanic briefed of any changes. Absolutely, if there's a change of 10 psi or more between flights or even over a short amount of time, it's time to troubleshoot.

To discuss this topic or other CF34 engine issues, call Bill Walker or Gerry Riffle at (800) 228.4277.