



Mainlube Superior Maintenance Lubricants Pty Ltd

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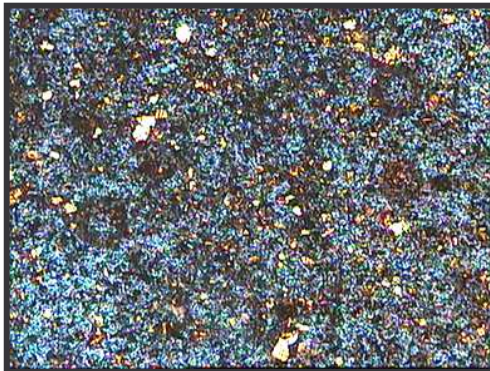
DATE 15/07/01

Oil Analysis No 1742 6 Speed Gearbox

Attention; Steve

Objective. Check oil for Wear Metal Particles and any possible contamination, Information found used to establish machine condition and future maintenance requirements.

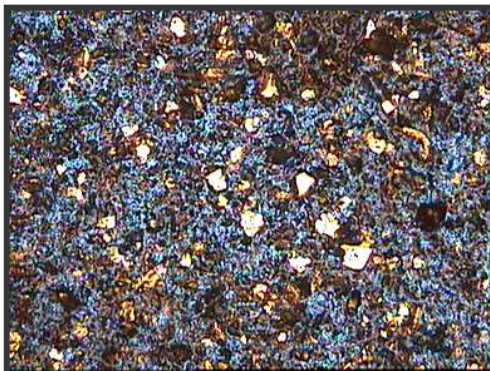
Method. Sample of approx 100 ml received from **VX SS Commodore@ 2000 K's, running on existing ATF applied when new.** Sample preparation in accordance with Mainlube standard laboratory practices. One sample processed 1 ml in volume; therefore the amount seen in the video pictures is the actual debris concentration per ml of oil.



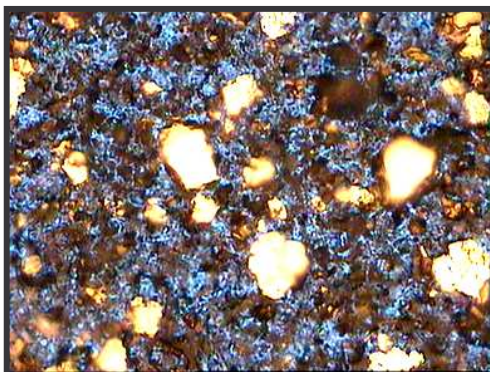
One cc of the sample oil has been forced through a 13-mm diameter 0.3-micron membrane filter @ 150 P.S.I. The membrane filter has caught any contaminates present, filters are glass slide mounted for examination.

This image represents a 1-mm diameter circle focused on the top layer of the filter @ 100X. The green/blue coloured background is the microscopes bottom light shining up through the glass slide illustrating density level of dirt, metal chunks and debris particles.

This image demonstrates the average debris level for sample No. 0000
*To achieve an acceptable life from this application,
this image should be clear, no particles*



**Overview density of dirt,
Wear Metal Chunks and debris particles @ 200X.**



Scuffing Wear Particles "Damaged Surface"

5-25 Microns

"Damaged Surface" Scuffing Wear Particles began when a primary wear mode was generated and not addressed.

The damaged, torn and protruding bearing surfaces, easily penetrate the lubricant film, allowing metal to metal contact, tearing off more metal. This creates excessive wear and eventual machine failure, if not addressed in time.

These spalling metal particles are carried by the oil flow through other load zones, snowballing the effect and further damaging load-bearing surfaces.

Damage will continue to this machine until the contamination is completely removed

Recommendations

This sample is contaminated with Scuffing Wear – “Damaged Surface

Scuffing Wear – “Damaged Surface” Particles began when a primary wear mode was generated and not addressed, together these wear modes are being forced through the load zone by the lubricant flow causing further damage by generating 3 Body Fatigue wear and finally rolled out flat to form Laminar Wear Metal particles.

This contamination is causing damage to the machine and should be removed at the first opportunity.

If no terminal damage is found then proceed with flushing.

Mainlube recommends that the gearbox flushed with Mainlube 245 Flush to assist with the debris removal. If after flushing there is a possibility that wear debris still remains, then repeat the process until they are both clean.

Replace the lubricant with Mainlube 151 E P Gear Oil SAE 75w90, run for 10 hours and take sample for benchmark. Retest every 500 hours until trends are established.

These recommendations and suggestions serve merely as a guide and in no way imply liability.

Steve Simmonds ATCAE
Managing Director