



Mack T8E for PC9

% Shear for Relative Viscosity

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Newer HD Engines Shear Oils to a Greater Extent

- Newer HD engines such as the N-14 and E-tech (1998-2000 vintage) have design changes which shear oils more effectively
- Older Mack and Cummins engines (1994-1997 vintage) show a lower level of shear
- Current limit of 50% DIN shear loss to calculate T-8E Relative Viscosity is no longer sufficient to predict field usage

Current Cummins N-14 Field Tests

- Tests use 1998-1999 N-14 engines with 435 HP
- Data includes eight engines run on 15W-40 oils
- Four oils and two Viscosity Modifier chemistries are represented
- Oil Drain intervals range from 15k to 50k miles

Current Mack E-7 Field Test

- Test is running on 1999-2000 E-Tech engines with 350 and 427 HP
- Data include five engines run on 15W-40 oils
- Five oils and two Viscosity modifier chemistries are represented
- Oil Drain intervals range from 10k-50k miles

Used Oil Viscosities from Current N-14 and E-7 Field Tests

- The 100 C kinematic viscosity (KV) from engines in these two field tests were measured
- Approximately half of the samples had KV's at or below the oil's DIN shear viscosity
- Approximately 80% of the samples had KV's below the 50% DIN shear value

Viscosity Data from Older Field Tests

- A 1997 test using V-Mack engines and a 1994 test using N-14 engines show a much lower level of shearing than the current tests
- These data include six engines run on five oils
- Less than 20% of the samples had KV's at or below the oil's DIN shear viscosity

Proposal

- To better match the amount of shearing seen with newer engines, the viscosity used for the T-8E Relative Viscosity calculation in the PC-9 Category should be moved from a 50% to 100% DIN shear value
- This change will increase T-8 test severity about 0.1 RV units for oils with 25-35 SSI polymer



Recommendation for T8E Pass/ Fail

Because Increase in Soot Levels in EPA 02 EGREngines

Relative Viscosity (100 % DIN) @ 4.8 % Soot

1.8 for PC 9