

1 DETERGENT COMPOSITION FOR A LOW SULFUR, LOW SULFATED ASH
2 AND LOW PHOSPHORUS LUBRICATING OIL FOR HEAVY DUTY DIESEL
3 ENGINES

4
5 ABSTRACT

6 The present invention is directed to a low sulfur, low sulfated ash and low
7 phosphorus lubricating oil composition for low emission heavy duty diesel
8 engines comprising (a) a major amount of an oil of lubricating viscosity and (b)
9 a detergent composition comprising a (i) a mixture of a metal salt of an alkyl
10 hydroxyaromatic carboxylic acid and a metal salt of an alkyl phenol, and (ii) a
11 metal salt of a Mannich condensation product of an alkyl phenol. The present
12 invention is also directed to a low sulfur, low sulfated ash and low phosphorus
13 lubricating oil concentrate comprising (a) an oil of lubricating viscosity and (b)
14 a detergent composition comprising a (i) a mixture of a metal salt of an alkyl
15 hydroxyaromatic carboxylic acid and a metal salt of an alkyl phenol, and (ii) a
16 metal salt of a Mannich condensation product of an alkyl phenol.