

CLAIMS

What is claimed is:

1. An engine lubricating oil composition providing improved low temperature valve train wear pursuant to the Sequence IVB engine test of ASTM D8350, the engine oil lubricating composition comprising:
 - one or more base oils of lubricating viscosity;
 - about 300 to about 1000 ppm molybdenum from an oil-soluble molybdenum compound;
 - one or more metal-containing detergents providing greater than about 5 TBN to the lubricating oil composition, wherein the TBN is measured using ASTM D4739;
 - wherein at least one of the one or more metal-containing detergents comprises an overbased magnesium detergent providing greater than about 2 TBN to the lubricating oil composition, wherein the TBN is measured using ASTM D4739;
 - less than about 0.2 weight percent of a polymeric pour point depressant;
 - wherein the engine oil composition has a viscosity grade according to SAE J 300 of 0W-8, 0W-12, 0W-16, or 0W-20; and
 - wherein a weight ratio of magnesium-to-molybdenum is about 0.8:1 or less.
2. The engine lubricating oil composition of claim 1, wherein the one or more overbased magnesium-containing detergent includes a magnesium sulfonate.
3. The engine lubricating oil composition of claim 1, wherein the lubricating oil composition further includes a calcium-containing detergent.
4. The engine lubricating oil composition of claim 1, wherein the one or more overbased magnesium-containing detergent has a total base number (TBN) of at least about 250 mg KOH/g.
5. The engine lubricating oil composition of claim 1, wherein the polymeric pour point depressant is a poly(meth)acrylate-based pour point depressant.

6. The engine lubricating oil composition of claim 5, wherein the polymeric pour point depressant is a poly(meth)acrylate copolymer having monomer units including (i) one or more monomer units selected from C1 to C16 (meth)acrylates and (2) vinyl pyrrolidone monomer units.

7. The engine lubricating oil composition of claim 5, wherein the engine lubricating oil composition is substantially free of poly(meth)acrylate-based dispersant pour point depressants.

8. The engine lubricating oil composition of claim 1, wherein the lubricating oil composition lubricates a hybrid gasoline-electric engine.

9. The engine lubricating oil composition of claim 8, wherein the hybrid gasoline electric engine includes a 2.0 liter or smaller gasoline engine.

10. The engine lubricating oil composition of claim 1, wherein the lubricating oil composition exhibits an average intake lifter volume loss of 2.7 mm^3 or less and a maximum end-of-test iron content of 400 ppm or less when measured pursuant to the sequence IVB engine test of ASTM D8350.

11. A method of lubricating a hybrid gasoline-electric engine to achieve improved low temperature valve train wear pursuant to the Sequence IVB engine test of ASTM D8350, the method comprising:

lubricating a hybrid electric-gasoline engine with a lubricating oil composition having a viscosity grade according to SAE J 300 of 0W-8, 0W-12, 0W-16, or 0W-20; and

the lubricating oil composition including one or more base oils of lubricating viscosity; about 300 to about 1000 ppm molybdenum from an oil-soluble molybdenum compound; one or more metal-containing detergent providing greater than about 5 TBN to the lubricating oil composition, wherein TBN is measured using ASTM D4739; wherein the at least one of the one or more metal-containing detergent comprises an overbased magnesium detergent providing greater than about 2 TBN to the lubricating oil composition, wherein the TBN is measured using ASTM D4739; and less than about 0.2 weight percent of

a polymeric pour point depressant; and wherein a weight ratio of magnesium-to-molybdenum in the lubricating oil composition is about 0.8:1 or less.

12. The method of claim 11, wherein the one or more overbased magnesium-containing detergents includes a magnesium sulfonate.

13. The method of claim 11, wherein the lubricating oil composition further includes a calcium-containing detergent.

14. The method of claim 11, wherein the one or more overbased magnesium-containing detergents has a total base number (TBN) of at least about 250 mg KOH/g.

15. The method of claim 11, wherein the polymeric pour point depressant is a poly(meth)acrylate-based pour point depressant.

16. The method of claim 15, wherein the polymeric pour point depressant is a poly(meth)acrylate copolymer having monomer units including (i) one or more monomer units selected from C1 to C16 (meth)acrylates and (ii) vinyl pyrrolidone monomer units.

17. The method of claim 15, wherein the lubricating oil composition is substantially free of the poly(meth)acrylate-based pour point depressants.

18. The method of claim 11, wherein the hybrid gasoline-electric engine includes a 2.0 liter or smaller gasoline engine.

19. The method of claim 11, wherein the lubricating oil composition exhibits an average intake lifter volume loss of 2.7 mm^3 or less and a maximum end-of-test iron content of 400 ppm or less when measured pursuant to the sequence IVB engine test of ASTM D8350.

20. The method of claim 11, wherein about 40 percent to about 100 percent of the detergent TBN is provided by an overbased magnesium sulfonate.