What is Claimed is:

1. A lubricating oil composition comprising:

greater than 50 wt.% of a base oil, based on a total weight of the lubricating oil composition; and

an additive composition comprising:

an amount of one or more zinc dialkyl dithiophosphate(s) sufficient to provide from about 350 ppm to about 2200 ppm zinc to the lubricating oil composition, based on the total weight of the lubricating oil composition,

an amount of one or more molybdenum-containing compound(s) sufficient to provide greater than 1 ppm to about 3000 ppm of molybdenum to the lubricating oil composition, based on the total weight of the lubricating oil composition,

one or more boron-containing dispersant(s), and

an amount of one or more magnesium-containing detergent(s) sufficient to provide less than 2050 ppm magnesium to the lubricating oil composition, based on the total weight of the lubricating oil composition,

wherein the lubricating oil composition has a total TBN of less than 7.5 mg KOH/g, as measured by the method of ASTM D-2896,

a weight ratio of ppm of zinc from the one or more zinc dialkyl dithiophosphate(s) to ppm of molybdenum from the one or more molybdenum-containing compound(s), is less than 10, and

a weight ratio of ppm of boron from the one or more boron-containing dispersant(s) to the total TBN of the lubricating oil composition in mg KOH/g of the lubricating oil composition, as measured by the method of ASTM D-2896, of from 32 to 36.

2. The lubricating oil composition of claim 1, wherein the lubricating oil composition has a total sulfated ash content of 2 wt.% or less, based on the total weight of the lubricating oil composition.

3. The lubricating oil composition of claim 1, wherein the weight ratio of ppm of zinc from the one or more zinc dialkyl dithiophosphate(s) to ppm of molybdenum from the one or more molybdenum-containing compound(s), is less than 6.

4. The lubricating oil composition of claim 1, wherein the one or more zinc dialkyl dithiophosphates comprises a first zinc dialkyl dithiophosphate derived from a primary alkyl alcohol and a second zinc dialkyl dithiophosphate derived from a secondary alkyl alcohol.

5. The lubricating oil composition of claim 1, wherein the one or more molybdenum-containing compound(s) comprises one or more compounds selected from sulfur-free organomolybdenum complexes of organic amides, molybdenum dithiocarbamates, molybdenum diothiophosphates and mixtures thereof.

6. The lubricating oil composition of claim 1, wherein the one or more molybdenum-containing compound(s) comprise a sulfur-free organomolybdenum complex of an organic amide.

7. The lubricating oil composition of claim 1, wherein the one or more molybdenum-containing compound(s) comprise a molybdenum dithiocarbamate.

8. The lubricating oil composition of claim 1, wherein the one or more magnesium-containing detergent(s) comprises an overbased magnesium-containing detergent having a total base number of greater than 225 mg KOH/g, as measured by the method of ASTM D-2896.

9. The lubricating oil composition of claim 1, wherein the one or more magnesium-containing detergent(s) comprises a detergent selected from magnesium sulfonate and magnesium phenate.

10. The lubricating oil composition of claim 1, wherein the one or more magnesium-containing detergent(s) is present in an amount sufficient to provide from 50 ppm to 1000 ppm magnesium to the lubricating oil composition, based on the total weight of the lubricating oil composition.

11. The lubricating oil composition of claim 1, further comprising one or more calcium-containing detergent(s) in an amount sufficient to provide from 500 ppm to 2000 ppm of calcium to the lubricating oil composition, based on the total weight of the lubricating oil composition.

12. The lubricating oil composition of claim 11, wherein the one or more calcium-containing detergent(s) comprise a detergent selected from a calcium sulfonate detergent and a calcium phenate detergent.

13. The lubricating oil composition of claim 1, wherein the one or more boron-containing dispersant(s) is present in an amount sufficient to provide less than 250 ppm of boron to the lubricating oil composition, based on the total weight of the lubricating oil composition.

14. The lubricating oil composition of claim 1, wherein the lubricating oil composition further comprises one or more additives selected from the group consisting of antioxidants, friction modifiers, pour point depressants, and viscosity index improvers.

15. The lubricating oil composition of claim 1, wherein the base oil has a kinematic viscosity at 100ºC of from 3.8 cSt to 12 cSt, as measured according to ASTM-445-19.

16. The lubricating oil composition of claim 1, wherein the base oil has a kinematic viscosity at 100ºC of from about 5 cSt to about 10 cSt, as measured according to ASTM-445-19.

17. The lubricating oil composition of claim 1, wherein the lubricating oil composition is an engine oil composition.

18. The lubricating oil composition of claim 1, wherein the lubricating oil composition, when used to lubricate an engine, achieves a timing chain stretch in an engine of 0.1 % or less, as measured by a Sequence X, Chain Wear Test of ASTM D8279.

19. A method for controlling timing chain stretch in an engine comprising a step of lubricating said timing chain with a lubricating oil composition comprising:

greater than 50 wt.% of a base oil, based on a total weight of the lubricating oil composition; and

an additive composition comprising

an amount of one or more zinc dialkyl dithiophosphate(s) sufficient to provide from about 350 ppm to about 2200 ppm zinc to the lubricating oil composition, based on the total weight of the lubricating oil composition,

an amount of one or more molybdenum-containing compound(s) sufficient to provide greater than 1 ppm to about 3000 ppm of molybdenum to the lubricating oil composition, based on the total weight of the lubricating oil composition,

an amount of one or more magnesium-containing detergent(s) sufficient to provide less than 2050 ppm magnesium to the lubricating oil composition, based on the total weight of the lubricating oil composition, and

one or more boron-containing dispersant(s);

wherein the lubricating oil composition has a total TBN of less than 7.5 mg KOH/g, as measured by the method of ASTM D-2896,

a weight ratio of ppm of zinc from the one or more zinc dialkyl dithiophosphate(s) to ppm of molybdenum from the one or more molybdenum-containing compound(s), is less than 10,

a weight ratio of ppm of boron from the one or more boron-containing dispersant(s) to the total TBN of the lubricating oil composition in mg KOH/g of the lubricating oil composition, as measured by the method of ASTM D-2896, of from 32 to 36; and

the lubricating oil composition achieves a timing chain stretch in an engine of 0.1 % or less, as measured by the Sequence X Engine Test of ASTM D8279.