

What is claimed is:

1. A lubricating oil composition comprising :

greater than 50 wt.% of a base oil of lubricating viscosity and one or more metal-containing detergent(s);

wherein a ratio of total metal from the one or more metal-containing detergent(s) in ppm in the lubricating oil composition to the total nitrogen in ppm in the lubricating oil composition is less than 1.9;

a ratio of total metal from the one or more metal-containing detergent(s) in ppm in the lubricating oil composition to the total boron in ppm in the lubricating oil composition is less than 7.5; and

a ratio of total metal from the one or more metal-containing detergent(s) in ppm in the lubricating oil composition to the total molybdenum in ppm in the lubricating oil composition is less than 23.8;

the lubricating oil composition has a NOACK volatility as measured by the method of ASTM D-5800 at 250 °C of less than 11.0 wt.%, and the lubricating oil composition is effective to ensure a TCO Temperature Increase of less than 9.0% as measured using the 2015 version of the General Motors dexos1® Turbocharger Coking Test.

2. The lubricating oil composition according to claim 1, wherein the ratio of total metal from the one or more metal-containing detergent(s) in ppm in the lubricating oil composition to the total nitrogen in ppm in the lubricating oil composition is less than 1.8.

3. The lubricating oil composition according to claim 1, wherein the ratio of total metal from the one or more metal-containing detergent(s) in ppm in the lubricating oil composition to the total boron in ppm in the lubricating oil composition is less than 7.3.

4. The lubricating oil composition according to claim 1, wherein the ratio of total metal from the one or more metal-containing detergent(s) in ppm in the lubricating oil composition to the total molybdenum in ppm in the lubricating oil composition is less than 20.0.

5. The lubricating oil composition according to claim 1, wherein the lubricating oil composition has a NOACK volatility as measured by the method of ASTM D-5800 at 250 °C of 2.0 wt.% to less than 11.0 wt.%.

6. The lubricating oil composition according to claim 1, wherein the lubricating oil composition is effective to ensure a TCO Temperature Increase of less than 8.0% as measured using the 2015 version of the General Motors dexos1® Turbocharger Coking Test.
7. The lubricating oil composition according to claim 1, wherein the lubricating oil composition has an 0W-20 rating.
8. A method for reducing or preventing formation of deposits in a boosted internal combustion engine comprising steps of:
 - lubricating a boosted internal combustion engine with the lubricating oil composition of claim 1, and
 - operating the engine lubricated with the lubricating oil composition.
9. The method of claim 8, wherein the lubricating oil composition is effective to ensure a TCO Temperature Increase of less than 9.0% as measured using the 2015 version of the General Motors dexos1® Turbocharger Coking Test.
10. A lubricating oil composition comprising:
 - greater than 50 wt.% of a base oil of lubricating viscosity;
 - one or more borated compound(s);
 - one or more molybdenum-containing compound(s) in an amount sufficient to provide greater than about 40 ppm by weight molybdenum to the lubricating oil composition, based on a total weight of the lubricating composition;
 - one or more magnesium-containing detergent(s);
 - one or more overbased calcium-containing detergent(s) in an amount sufficient to provide less than about 1800 ppm by weight calcium to the lubricating oil composition, based on the total weight of the lubricating composition.
11. The lubricating oil composition according to claim 10, wherein the one or more molybdenum containing compound(s) is present in an amount sufficient to provide at least about 50 ppm by weight molybdenum to the lubricating oil composition, based on a total weight of the lubricating oil composition.
12. The lubricating oil composition according to claim 10, wherein the one or more calcium-

containing overbased detergent(s) is selected from an overbased calcium sulfonate detergent, an overbased calcium phenate detergent, and an overbased calcium salicylate detergent.

13. The lubricating oil composition according to claim 10, wherein the one or more magnesium-containing detergent(s) is overbased, and wherein the one or more overbased calcium-containing detergent(s) and the one or more overbased magnesium-containing detergent(s) each have a total base number of greater than 225 mg KOH/g, measured by the method of ASTM D-2896.

14. The lubricating oil composition according to claim 10, wherein the one or more overbased magnesium containing detergent(s) is an overbased magnesium sulfonate.

15. The lubricating oil composition according to claim 10, wherein the one or more magnesium-containing detergent(s) is in an amount sufficient to provide 20 ppm to 1800 ppm magnesium to the lubricating oil composition, based on the total weight of the lubricating composition.

16. The lubricating oil composition according to claim 10, wherein the ratio of total boron in ppm in the lubricating oil composition to total nitrogen in ppm in the lubricating oil composition is less than about 0.29.

17. The lubricating oil composition according to claim 10, wherein the ratio of total calcium in ppm in the lubricating oil composition to total boron in ppm in the lubricating oil composition is greater than about 4.9 to less than about 9.7.

18. The lubricating oil composition according to claim 10, wherein the weight percent calcium from the one or more overbased calcium-containing detergent(s) based on the total weight of calcium and magnesium from the one or more overbased calcium-containing detergent(s) and the one or more overbased magnesium-containing detergent(s), is greater than 50 wt.%.

19. The lubricating oil composition according to claim 10, wherein the lubricating oil composition is effective to ensure a TCO Temperature Increase of less than 9.0% as measured using the 2015 version of the General Motors dexos1® Turbocharger Coking Test.

20. The lubricating oil composition according to claim 10, wherein the lubricating oil composition has a 5W-30 rating.

21. A method for reducing or preventing formation of deposits in a boosted internal combustion engine comprising steps of:

lubricating a boosted internal combustion engine with the lubricating oil composition of claim 8, and

operating the engine lubricated with the lubricating oil composition.

22. The method of claim 21, wherein the lubricating oil composition is effective to ensure a TCO Temperature Increase of less than 9.0% as measured using the 2015 version of the General Motors dexos1® Turbocharger Coking Test.