WHAT IS CLAIMED IS:

1. A lubricating oil composition having a HTHS viscosity at 150°C in a range of 1.7 to 3.2 mPa s and a low temperature cold cranking viscosity of less than 7,000 mPa s at -20 °C, comprising:

(a) a major amount of an oil of lubricating viscosity having a kinematic viscosity at 100°C of from 3.5 mm^2/s to 20 mm^2/s and a viscosity index of greater than 120 with a sulfur content of less than 0.03 wt.%, are classified into the API group III, IV, or V base stock category, and have an aromatics content (C_A) of less than 5%;

(b) an organomolybdenum compound providing greater than 0.0050 wt.% of molybdenum to the lubricating oil composition;

(c) a dispersed hydrated alkali metal borate compound providing greater than 0.0050 to 0.060 wt.% of alkali metal to the lubricating oil composition;

(d) a sulfur phosphorus anti-wear compound providing the lubricating oil composition with from 0 to 0.06 wt.% of phosphorus;

(e) one or more dispersants providing the lubricating oil composition with greater than 0.0050 to 0.040 wt.% of nitrogen; and

(f) one or more calcium-based metal detergents selected from salicylate, sulfonate, and phenate;

(g) optionally, one or more magnesium-based metal detergents selected from salicylate, sulfonate, and phenate; and

wherein the lubricating oil composition has a calcium content of from 0.14 to 0.30 wt.%, when present a magnesium content of from 0.0005 to 0.060 wt.%, a total nitrogen amount of from 0.0050 to 0.090 wt.%, sulfur content of less than 0.13 wt.% and a sulfated ash level of from 0.6 to 1.1 wt.%.

2. The lubricating oil composition of claim 1, wherein the organomolybdenum compound provides from 0.0050 to 0.050 wt.% of molybdenum to the lubricating oil composition.

3. The lubricating oil composition of claim 1, wherein the dispersed hydrated alkali metal borate compound provides from 0.0050 to 0.10 wt.% of boron to the lubricating oil composition.

4. The lubricating oil composition of claim 1, wherein phosphorus is present from 0 to 0.04 wt.% based on the total weight of lubricating oil composition.

5. The lubricating oil composition of claim 1, wherein phosphorus is present from 0 to 0.03 wt.% based on the total weight of lubricating oil composition.

6. The lubricating oil composition of claim 1, wherein the lubricating oil composition is free of phosphorus.

7. The lubricating oil composition of claim 1, wherein the lubricating oil composition is a 0W-8, 0W-12, 0W-16, or 0W-20 SAE viscosity grade.

8. The lubricating oil composition of claim 1, wherein the lubricating oil composition has a kinematic viscosity at 100°C of from 3.5 mm^2/s to 12 mm^2/s.

9. A method for improving wear, high temperature detergency, and thermal stability in an engine comprising operating said engine with a lubricating oil composition having a HTHS viscosity at 150°C in a range of 1.7 to 3.2 mPa s and a low temperature cold cranking viscosity of less than 7,000 mPa s at -20 °C, comprising:

(a) a major amount of an oil of lubricating viscosity having a kinematic viscosity at 100°C of from 3.5 mm^2/s to 20 mm^2/s and a viscosity index of greater than 120 with a sulfur content of less than 0.03 wt.%, are classified into the API group III, IV, or V base stock category, and have an aromatics content (C_A) of less than 5%;

(b) an organomolybdenum compound providing greater than 0.0050 wt.% of molybdenum to the lubricating oil composition;

(c) a dispersed hydrated alkali metal borate compound providing greater than 0.0050 to 0.060 wt.% of alkali metal to the lubricating oil composition;

(d) a sulfur phosphorus anti-wear compound providing the lubricating oil composition with from 0 to 0.06 wt.% of phosphorus;

(e) one or more dispersants providing the lubricating oil composition with greater than 0.005 to 0.040 wt.% of nitrogen; and

(f) one or more calcium-based metal detergents selected from salicylate, sulfonate, and phenate;

(g) optionally, one or more magnesium-based metal detergents selected from salicylate, sulfonate, and phenate; and

wherein the lubricating oil composition has a calcium content of from 0.14 to 0.30 wt.%, when present a magnesium content of from 0.0005 to 0.060 wt.%, a total nitrogen amount of from 0.0050 to 0.090 wt.%, sulfur content of less than 0.13 wt.% and a sulfated ash level of from 0.6 to 1.1 wt.%.

10. The method of claim 9, wherein the organomolybdenum compound provides from 0.0050 to 0.050 %wt of molybdenum to the lubricating oil composition.

11. The method of claim 9, wherein the dispersed hydrated alkali metal borate compound provides from 0.0050 to 0.10 wt.% of boron to the lubricating oil composition.

12. The method of claim 9, wherein phosphorus is present from 0 to 0.04 wt.% based on the total weight of lubricating oil composition.

13. The method of claim 9, wherein phosphorus is present from 0 to 0.03 wt.% based on the total weight of lubricating oil composition.

14. The method of claim 9, wherein the lubricating oil composition is free of phosphorus.

15. The method of claim 9, wherein sulfur is present from 0.01 to 0.4 wt.% based on the total weight of the lubricating oil composition.

16. The method of claim 9, wherein sulfated ash is present from 1.1 to 0.6 wt.% based on the total weight of the lubricating oil composition.

17. The method of claim 9, wherein the lubricating oil composition is a 0W-8, 0W-12, 0W-16, or 0W-20 SAE viscosity grade.

18. The method of claim 9, wherein the lubricating oil composition has a HTHS viscosity at 150 ^{o}C in a range of 2.0 to 3.6 mPa s.

19. The method of claim 9, wherein the lubricating oil composition has a kinematic viscosity at 100°C of from 3.5 mm^2/s to 12 mm^2/s.

20. The method of claim 9, wherein the lubricating oil is selected from one or more of API Group III, IV, and V.