WHAT IS CLAIMED IS:

1. A lubricating oil composition having a HTHS viscosity at 150°C in a range of ~~about~~ 1.7 to ~~about~~ 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 ~~about~~ 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 ~~about~~ 0.06 wt.% of phosphorus;

(e) one or more dispersants providing the lubricating oil composition with greater than 0.0050 to ~~about~~ 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 ~~about~~ 0.14 to ~~about~~ 0.30 wt.%, when present a magnesium content of from ~~about~~ 0.0005 to ~~about~~ 0.060 wt.%, a total nitrogen amount of from 0.0050 to ~~about~~ 0.090 wt.%, sulfur content of less than 0.13 wt.% and a sulfated ash level of from ~~about~~ 0.6 to ~~about~~ 1.1 wt.%.

2. The lubricating oil composition of claim 1, wherein the organomolybdenum compound provides from ~~about~~ 0.0050 to ~~about~~ 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 ~~about~~ 0.0050 to ~~about~~ 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 ~~about~~ 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 ~~about~~ 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 sulfur is present from about 0.01 to about 0.4 wt.% based on the total weight of the lubricating oil composition.~~

~~8. The lubricating oil composition of claim 1, wherein sulfated ash is present from about 1.1 to about 0.6 wt.% based on the total weight of the lubricating oil composition.~~

7~~9~~. 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.

~~10. The lubricating oil composition of claim 1, wherein the lubricating oil composition has a HTHS viscosity at 150 °C in a range of about 2.0 to about 3.6 mPa s.~~

~~11~~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.

~~12. The lubricating oil composition of claim 1, wherein the lubricating oil is selected from one or more of API Group III, IV, and V.~~

~~13~~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 ~~about~~ 1.7 to ~~about~~ 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 ~~about~~ 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 ~~about~~ 0.06 wt.% of phosphorus;

(e) one or more dispersants providing the lubricating oil composition with greater than 0.005 to ~~about~~ 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 ~~about~~ 0.14 to ~~about~~ 0.30 wt.%, when present a magnesium content of from ~~about~~ 0.0005 to ~~about~~ 0.060 wt.%, a total nitrogen amount of from 0.0050 to ~~about~~ 0.090 wt.%, sulfur content of less than 0.13 wt.% and a sulfated ash level of from ~~about~~ 0.6 to ~~about~~ 1.1 wt.%.

~~14~~10. The method of claim ~~13~~9, wherein the organomolybdenum compound provides from ~~about~~ 0.0050 to ~~about~~ 0.050 %wt of molybdenum to the lubricating oil composition.

~~15~~11. The method of claim ~~13~~9, wherein the dispersed hydrated alkali metal borate compound provides from ~~about~~ 0.0050 to ~~about~~ 0.10 wt.% of boron to the lubricating oil composition.

~~16~~12. The method of claim ~~13~~9, wherein phosphorus is present from 0 to ~~about~~ 0.04 wt.% based on the total weight of lubricating oil composition.

~~17~~13. The method of claim ~~13~~9, wherein phosphorus is present from 0 to ~~about~~ 0.03 wt.% based on the total weight of lubricating oil composition.

~~18~~14. The method of claim ~~13~~9, wherein the lubricating oil composition is free of phosphorus.

~~19~~15. The method of claim ~~13~~9, wherein sulfur is present from ~~about~~ 0.01 to ~~about~~ 0.4 wt.% based on the total weight of the lubricating oil composition.

~~20~~16. The method of claim ~~13~~9, wherein sulfated ash is present from ~~about~~ 1.1 to ~~about~~ 0.6 wt.% based on the total weight of the lubricating oil composition.

~~21~~17. The method of claim ~~13~~9, wherein the lubricating oil composition is a 0W-8, 0W-12, 0W-16, or 0W-20 SAE viscosity grade.

~~22~~18. The method of claim ~~13~~9, wherein the lubricating oil composition has a HTHS viscosity at 150 ^{o}C in a range of ~~about~~ 2.0 to ~~about~~ 3.6 mPa s.

~~23~~19. The method of claim ~~13~~9, wherein the lubricating oil composition has a kinematic viscosity at 100^{o}C of from 3.5 mm^2/s to 12 mm^2/s.

~~24~~20. The method of claim ~~13~~9, wherein the lubricating oil is selected from one or more of API Group III, IV, and V.