CLAIMS:

1. A method for preventing or reducing engine knock or pre-ignition in a high compression spark ignition engine lubricated with a lubricating oil by using as the lubricating oil a formulated oil including a Group I, Group II, Group III, Group IV, Group V base oil, or mixtures thereof, said formulated oil having a composition comprising at least one branched hydrocarbon having about 55% of the carbons in the form of methyl groups and a number average molecular weight of 282 to 370,

wherein the at least one branched hydrocarbon is present in an amount of from 90 to 95 weight percent, based on the total weight of the formulated oil, and

wherein the at least one branched hydrocarbon, when 1% of which is added to isooctane, maintains at least 100% of the isooctane ignition or combustion delays as determined using the equipment and test conditions of ASTM D7668.

2. The method of claim 1 wherein the at least one branched hydrocarbon has at least 20 carbon atoms.

3. The method of claim 1 wherein the at least one branched hydrocarbon comprises at least one poly(branched alkene) or at least one branched alkane or at least one branched alkene.

4. The method of claim 3 wherein the at least one poly(branched alkene) is derived from a C4 to C20 branched alkene.

5. The method of claim 3 wherein the at least one poly(branched alkene) comprises a hydrogenated polyisobutene base oil or an isoeicosane base oil.

6. The method of claim 1 wherein the at least one branched hydrocarbon has at least 20% of the carbons in the form of quaternary carbons.

7. The method of claim 1 wherein the formulated oil further comprises at least one dialkyl adipic acid ester having at least 20% of the total alkyl carbons in the form methyl groups.

8. The method of claim 7 wherein the dialkyl adipic acid ester is selected from the group consisting of diisopropyl adipate, diisobutyl adipate, diisopentyl adipate, diisohexyl adipate, diisooctyl adipate, diisononyl adipate, diisodecyl adipate, and mixtures thereof.

9. The method of claim 1 wherein the formulated oil further comprises at least one branched polyol ester having at least 35% of the carbons in the form of methyl groups.

10. The method of claim 1 wherein the lubricating oil further comprises one or more of an ionic detergent, a non-ionic detergent, dispersant, antiwear agent, viscosity index improver, antioxidant, pour point depressant, corrosion inhibitor, metal deactivator, seal compatibility additive, anti-foam agent, inhibitor, anti-rust additive, and friction modifier.

11. The method of claim 1 wherein the lubricating oil further comprises one or more of a polymethacrylate or polyacrylate dispersant.

12. The method of claim 1 wherein the high compression spark ignition engine has a compression ratio of at least 13.

13. The method of claim 1 wherein the high compression spark ignition engine is a super-charged engine or a turbo-charged engine.

14. The method of claim 1 wherein the pre-ignition is low speed pre-ignition (LSPI).

15. A method for preventing or reducing engine knock or pre-ignition in a high compression spark ignition engine lubricated with a lubricating oil by using as the lubricating oil a formulated oil including a Group I, Group II, Group III, Group IV, Group V base oil, or mixtures thereof, said formulated oil having a composition comprising at least one branched polyol ester,

wherein the at least one branched polyol ester includes from 42% to 45% of the carbons in the form of methyl groups,

wherein the at least one branched polyol ester is a mono-pentaerythritol ester of branched mono-carboxylic acids base oil or a di-pentaerythritol ester of branched mono-carboxylic acids base oil,

wherein the branched mono-carboxylic acids are selected from the group consisting of 2,2-dimethyl propionic acid (neopentanoic acid), neoheptanoic acid, iso-hexanoic acid, 3,5,5-trimethyl hexanoic acid (TMH), isoheptanoic acid, isooctanoic acid, isononanoic acid, isodecanoic acid, and mixtures thereof,

wherein the at least one branched polyol ester is present in an amount of from 90 to 95 weight percent, based on the total weight of the formulated oil, and

wherein the at least one branched polyol ester, when 1% of which is added to isooctane, maintains at least 100% of the isooctane ignition or combustion delays as determined using the equipment and test conditions of ASTM D7668.

16. The method of claim 15 wherein the at least one branched polyol ester has at least 17 carbon atoms.

17. The method of claim 15 wherein the at least one branched polyol ester has at least 20% of the carbons in the form of quaternary carbons.

18. The method of claim 15 wherein the lubricating oil further comprises at least one dialkyl adipic acid ester having at least 20% of the total alkyl carbons in the form methyl groups.

19. The method of claim 18 wherein the dialkyl adipic acid ester is selected from the group consisting of diisopropyl adipate, diisobutyl adipate, diisopentyl adipate, diisohexyl adipate, diisooctyl adipate, diisononyl adipate, diisodecyl adipate, and mixtures thereof.

20. The method of claim 15 wherein the lubricating oil further comprises one or more of an ionic detergent, a non-ionic detergent, dispersant, antiwear agent, viscosity index improver, antioxidant, pour point depressant, corrosion inhibitor, metal

deactivator, seal compatibility additive, anti-foam agent, inhibitor, anti-rust additive, and friction modifier.

21. The method of claim 15 wherein the lubricating oil further comprises one or more of a polymethacrylate or polyacrylate dispersant.

22. The method of claim 15 wherein the high compression spark ignition engine has a compression ratio of at least 13.

23. The method of claim 15 wherein the high compression spark ignition engine is a super-charged engine or a turbo-charged engine.

24. The method of claim 15 wherein the pre-ignition is low speed pre-ignition (LSPI).