What is claimed is:

1. A lubricant composition comprising:

(a) an oil of lubricating viscosity and

(b) a phosphonate ester other than a zinc salt, comprising the reaction product of (i) phosphonic acid or a monomeric ester thereof with an alcohol mixture comprising (ii) an alkyl-substituted 1,3-propane diol with one or more of the alkyl substituents thereof being on one or more of the carbon atoms of the propyl unit such that the total number of carbon atoms in the alkyl-substituted 1,3-propane diol ranges from 5 to 12 and (iii) an alkane diol having two hydroxy groups in a 1, 4 or 1, 5 or 1, 6 relationship; and wherein the relative molar amounts of the alkyl-substituted 1,3-propane diol (ii) and the alkane diol (iii) in the alcohol mixture are in a ratio greater than 95:5; and

wherein the ratio of (i) to the alcohol mixture is 0.9:1.1 to 1.1:0.9; and

wherein the phosphonate ester composition comprises at least one oligomeric species comprising 2 to 20 phosphorus atoms and at least one cyclic monomeric species comprising a single phosphorus atom, wherein the relative amount of the cyclic monomeric species to the amount of the oligomeric species is 8:1 to 3:1 by weight.

2. The lubricant composition of claim 1, wherein the relative molar amounts of the propanediol (ii) and the alkane diol (iii) in the alcohol mixture are in a ratio 96:4 to 99:1.

3. The lubricant composition of claim 2, wherein the alcohol mixture further comprises (iv) a mono alcohol having 2 to 20carbon atoms, and wherein the mono alcohol is present at 0.1 to 1 wt%, based on the total weight of the total alcohol mixture.

4. The lubricant composition of any of the above claims, wherein the amount of the phosphonate ester ranges from 0.05 to 1.0 wt%, based on a total weight of the lubricant composition.

5. The lubricant composition of any of the above claims, wherein the monomeric phosphonate ester comprises dimethyl phosphite.

6. The lubricant composition of any one of claims 1 through 5, wherein the alkyl-substituted 1,3-propane diol comprises 2-ethyl-2-butyl-1,3-propanediol, 2-ethylhexane-1,3-diol, 2,2-dibutyl-1,3-propanediol, 2-methyl-2-propyl-1,3-propanediol, or combinations thereof.

7. The lubricant composition of any one of claims 1 through 6, wherein the alkane diol comprises 1,4-butanediol, 1,5-pentanediol, 1,6-hexanediol, or mixtures thereof.

8. The lubricant composition of any of the above claims, comprising a cyclic monomeric species comprising a single phosphorus atom and a chain of 3 carbon atoms derived from the alkyl-substituted 1,3-propane diol.

9. The lubricant composition of any of claims 1 through 8, wherein the oil of lubricating viscosity is a Group I base oil.

10. The lubricant composition of claim 9, wherein the Group I base oil has a kinematic viscosity at 40℃ of 18 to 115 cSt.

11. The lubricant composition of any of claims 1 through 10 further comprising at least one dispersant, viscosity modifier, antioxidant, or corrosion inhibitor.

12 The lubricant composition of claim 11 comprising a substituted thiadiazole corrosion inhibitor.

13. The lubricant composition of any of the above claims, wherein the lubricant composition has a Timken rating as measured using D2782 of greater than 45 pounds.

14. The lubricant composition of any of the above claims, wherein the lubricant composition has a 4-ball weld point of at least 200 kilograms-force and a load wear index of at least 45 kilograms-force as measured using D2783.

15. A method for lubricating a mechanical device, comprising supplying thereto the lubricant composition of any of claims 1 through 14.

16. The method of claim 15, wherein said mechanical device is a drivetrain component.

17. The method of claim 16, wherein said drivetrain component is an automatic transmission, a manual transmission, a dual clutch transmission, or a continuously variable transmission such as a push-belt transmissions or traction drive.

18. The method of claim 16 wherein said mechanical device comprises a gear.

19. The use of a phosphonate ester other than a zinc salt in a lubricant composition wherein the phosphonate ester comprises the reaction product of (i) phosphonic acid or a monomeric ester thereof with an alcohol mixture comprising (ii) an alkyl-substituted 1,3-propane diol with one or more of the alkyl substituents thereof being on one or more of the carbon atoms of the propyl units are substituted such that the total number of carbon atoms in the alkyl-substituted 1,3-propane diol ranges from 5 to 12 and (iii) alkane diol having two hydroxy groups in a 1, 4 or 1, 5 or 1, 6 relationship and wherein the relative molar amounts of the alkyl-substituted 1,3-propane diol (ii) and the alkane diol (iii) in the alcohol mixture are in a ratio greater than 95:5; and

wherein the ratio of (i) to the alcohol mixture is 0.9:1.1 to 1.1:0.9; and

wherein the phosphonate ester composition comprises at least one oligomeric species comprising 2 to 20 phosphorus atoms and at least one cyclic monomeric species comprising a single phosphorus atom, wherein the relative amount of the cyclic monomeric species to the amount of the oligomeric species is 8:1 to 3:1 by weight,

to improve Timken performance as measured using D2782 and/or 4-ball weld point as measured using D2783, and/or demulsibility as measured using D1401, and/or stability of said lubricant composition.