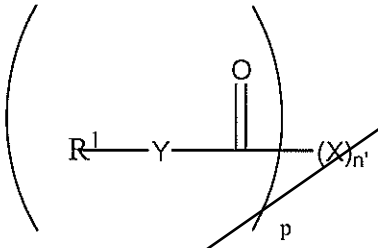
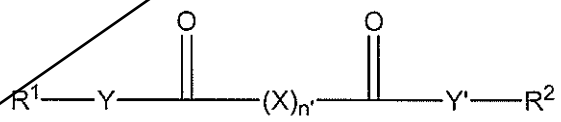
What is claimed is:

1. A method for lubricating a driveline device comprising supplying to the driveline device a lubricating composition comprising an oil of lubricating viscosity and an antiwear package, wherein the antiwear package comprises:

(a) an antiwear agent which may be represented by a compound of Formula (1a) and/or (1b):



Formula (1a)



Formula (1b)

wherein

n' is 0 to 10 for Formula (1b), and 1 to 10 for Formula (1a);

p is 1 to 5;

Y and Y' are independently -O-, >NH, >NR^3, or an imide group formed by taking together both Y and Y' groups in (1b) or two Y groups in (1a) and forming a R^1-N< group between two >C=O groups;

X is independently -CH_2-, >CHR^4 or >CR^{4}R^5, >CHOR^6, or >C(CO_2R^6)$_2$, -CH_3, -CH_2R^4 or CHR^{4}R^5, -CH_2OR^6, or -CH(CO_2R^6)$_2$, ≡C-R^6, or mixtures thereof to fulfill the valence of Formula (1a) and/or (1b), with the proviso that ≡C-R^6 only applies to Formula (1a);

R^1 and R^2 are independently hydrocarbyl groups;

R^3 is a hydrocarbyl group;

R^4 and R^5 are independently keto-containing groups (such as acyl groups), ester groups or hydrocarbyl groups; and

R^6 is independently hydrogen or a hydrocarbyl group, typically containing 1 to 150 carbon atoms; and

(b) a phosphorus compound.

2. The method of claim 1, wherein the phosphorus compound is an amine or metal salt of a phosphorus compound that is either:

(i) a hydroxy-substituted di- ester of (thio)phosphoric acid, or

(ii) a phosphorylated hydroxy-substituted di- or tri- ester of (thio)phosphoric acid.

3. The method of any preceding claim, wherein the amine or metal salt of a phosphorus compound is a hydroxy-substituted di- ester of (thio)phosphoric acid.

4. The method of any preceding claim, wherein the amine or metal salt of a phosphorus compound is a phosphorylated hydroxy-substituted di- or tri- ester of (thio)phosphoric acid.

5. The method of any preceding claim, wherein the phosphorus compound is either:

(i) a hydroxy-substituted di- ester of phosphoric acid, or

(ii) a phosphorylated hydroxy-substituted di- or tri- ester of phosphoric acid

6. The method of any preceding claim, wherein Formula (1a) and (1b) have at least one X that is hydroxyl-containing.

7. The method of any preceding claim, wherein the compounds of Formula (1a) and (1b) are derivative of a hydroxycarboxylic acid selected from the group consisting of imides, di-esters, di-amides, di-imides, ester-amides, ester-imides, imide-amides.

8. The method of claim 7, wherein the derivatives of hydroxycarboxylic acid are selected from the group consisting of imides, di-esters, di-amides, and ester-amides.

9. The method of claim 7, wherein the derivatives of hydroxycarboxylic acid are derived from tartaric acid.

10. The method of any preceding claim, wherein the antiwear package is present at 0.01 wt % to 10 wt %, or 0.05 wt % to 5 wt % of the lubricating composition.

11. The method of any preceding claim, wherein the compound of Formula (1a) or (1b) is present at 0.005 wt % to 10 wt %, or 0.025 to 2.5 wt % of the lubricating composition.

12. The method of any preceding claim, wherein the phosphorus compound is present at 0.005 wt % to 10 wt %, or 0.05 to 2.5 wt % of the lubricating composition.

13. The method of any preceding claim, wherein the lubricating composition has a sulphur-content of greater than 0.3 wt %, or 0.4 wt % to 5 wt % of the lubricating composition.

14. The method of any preceding claim, wherein the driveline device is a manual transmission or a gear, a gearbox, an axle gear, or an automatic transmission.

15. The method of any preceding claim, wherein the driveline device is a manual transmission, a gear, or a gearbox.

16. The method of any preceding claim, wherein the driveline device is an automatic transmission or an axle gear.

17. The method of any preceding claim, wherein the lubricating composition further comprises an organo-sulphide, or mixtures thereof.

18. The method of claim 17, wherein the organo-sulphide comprises at least one of a polysulphide, thiadiazole compound, or mixtures thereof.

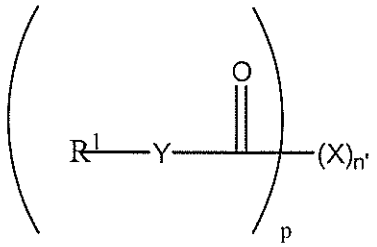
19. The method of any preceding claim, wherein the lubricating composition further comprises a viscosity modifier selected from the group consisting of polyisobutenes, polymethacrylates, polyacrylates, esters of maleic anhydride-styrene copolymers, esters of maleic anhydride-olefin copolymers, and mixtures thereof.

20. The method of claim 19, wherein the viscosity modifier is a polymethacrylate.

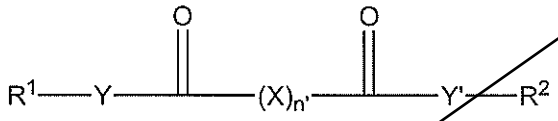
21. The method of any preceding claim 19 to 20, wherein the viscosity modifier is present 5 wt % to 60 wt %, or greater than 12 wt % to 55 wt %, of the lubricating composition.

22. A lubricating composition comprising an oil of lubricating viscosity and an antiwear package, wherein the antiwear package comprises:

(a) an antiwear agent which may be represented by a compound of Formula (1a) and/or (1b):



Formula (1a)



Formula (1b)

wherein

n' is 0 to 10 for Formula (1b), and 1 to 10 for Formula (1a);

p is 1 to 5;

Y and Y' are independently -O-, >NH, >NR^3, or an imide group formed by taking together both Y and Y' groups and forming a R^1-N< group between two >C=O groups;

X is independently -CH_2-, >CHR^4 or >CR^{4}R^5, >CHOR^6, or >C(CO_2R^6)$_2$, -CH_3, -CH_2R^4 or CHR^{4}R^5, -CH_2OR^6, or -CH(CO_2R^6)$_2$, ≡C-R^6, or mixtures thereof to fulfill the valence of Formula (1a) and/or (1b), with the proviso that ≡C-R^6 only applies to Formula (1a);

R^1 and R^2 are independently hydrocarbyl groups;

R^3 is a hydrocarbyl group;

R^4 and R^5 are independently keto-containing groups, ester groups or hydrocarbyl groups; and

R^6 is independently hydrogen or a hydrocarbyl group; and

(b) an amine or metal salt of a phosphorus compound that is either

(i) a hydroxy-substituted di- ester of (thio)phosphoric acid, or

(ii) a phosphorylated hydroxy-substituted di- or tri- ester of (thio)phosphoric acid.

23. The lubricating composition of claim 22, wherein the compound of Formula (1a) and (1b) is a derivative of a hydroxycarboxylic acid.

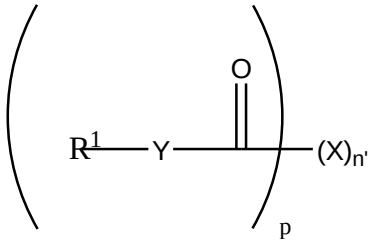
24. The lubricating composition of claim 23, wherein the derivative of a hydroxycarboxylic acid is selected from the group consisting of imides, di-esters, di-amides, and ester-amides.

25. The lubricating composition of any preceding claim 23 to 24, wherein the derivative of a hydroxycarboxylic acid is derived from tartaric acid.

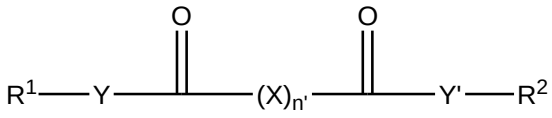
What is claimed is:

1. A method for lubricating a driveline device comprising supplying to the driveline device a lubricating composition comprising an oil of lubricating viscosity and an antiwear package, wherein the antiwear package comprises:

(a) 0.025 to 2.5 wt % of an antiwear agent which may be represented by a compound of Formula (1a) and/or (1b):



Formula (1a)



Formula (1b)

wherein

n' is 0 to 10 for Formula (1b), and 1 to 10 for Formula (1a);

p is 1 to 5;

Y and Y' are independently -O-, >NH, >NR^3, or an imide group formed by taking together both Y and Y' groups in (1b) or two Y groups in (1a) and forming a R^1-N< group between two >C=O groups;

X is independently -CH_2-, >CHR^4 or >CR^4R^5, >$CHOR^6$, or >$C(CO_2R^6)_2$, -CH_3, -CH_2R^4 or CHR^4R^5, -CH_2OR^6, or -$CH(CO_2R^6)_2$, ≡C-R^6, or mixtures thereof to fulfill the valence of Formula (1a) and/or (1b), with the proviso that ≡C-R^6 only applies to Formula (1a) and -CH_3, -CH_2R^4, -CHR^4R^5, -CH_2OR^6, -$CH(CO_2R^6)_2$ do not apply to Formula (1b);

R^1 and R^2 are independently hydrocarbyl groups;

R^3 is a hydrocarbyl group;

R^4 and R^5 are independently keto-containing groups (such as acyl groups), ester groups or hydrocarbyl groups; and

R^6 is independently hydrogen or a hydrocarbyl group, typically containing 1 to 150 carbon atoms; and

(b) 0.05 to 2.5 wt % of a phosphorus compound,

wherein the phosphorus compound is an amine or metal salt of a phosphorus compound that is either:

(i) a hydroxy-substituted di- ester of (thio)phosphoric acid, or

(ii) a phosphorylated hydroxy-substituted di- or tri- ester of (thio)phosphoric acid.

2. The method of claim 1, wherein the amine or metal salt of a phosphorus compound is a hydroxy-substituted di- ester of (thio)phosphoric acid.

3. The method of claim 1, wherein the amine or metal salt of a phosphorus compound is a phosphorylated hydroxy-substituted di- or tri- ester of (thio)phosphoric acid.

4. The method of claim 1, wherein the phosphorus compound is either:

(i) a hydroxy-substituted di- ester of phosphoric acid, or

(ii) a phosphorylated hydroxy-substituted di- or tri- ester of phosphoric acid

5. The method of any one of the preceding claims, wherein Formula (1a) and (1b) have at least one X that is hydroxyl-containing.

6. The method of any one of the preceding claims, wherein the compounds of Formula (1a) and (1b) are derivatives of a hydroxycarboxylic acid selected from the group consisting of imides, di-esters, di-amides, di-imides, ester-amides, ester-imides, and imide-amides.

7. The method of claim 6, wherein the derivatives of hydroxycarboxylic acid are selected from the group consisting of imides, di-esters, di-amides, and ester-amides.

8. The method of claim 6, wherein the derivatives of hydroxycarboxylic acid are derived from tartaric acid.

9. The method of any one of the preceding claims, wherein the antiwear package is present at 0.01 wt % to 10 wt %, or 0.05 wt % to 5 wt % of the lubricating composition.

10. The method of any one of the preceding claims, wherein the lubricating composition has a sulphur-content of greater than 0.3 wt %, or 0.4 wt % to 5 wt % of the lubricating composition.

11. The method of any one of the preceding claims, wherein the driveline device is a manual transmission or a gear, a gearbox, an axle gear, or an automatic transmission.

12. The method of any one of the preceding claims, wherein the driveline device is a manual transmission, a gear, or a gearbox.

13. The method of any one of claims 1 to 11, wherein the driveline device is an automatic transmission or an axle gear.

14. The method of any one of the preceding claims, wherein the lubricating composition further comprises an organo-sulphide.

15. The method of claim 14, wherein the organo-sulphide comprises at least one of a polysulphide, thiadiazole compound, or mixtures thereof.

16. The method of any one of the preceding claims, wherein the lubricating composition further comprises a viscosity modifier selected from the group consisting of polyisobutenes, polymethacrylates, polyacrylates, esters of maleic anhydride-styrene copolymers, esters of maleic anhydride-olefin copolymers, and mixtures thereof.

17. The method of claim 16, wherein the viscosity modifier is a polymethacrylate.

18. The method of claim 16 or 17, wherein the viscosity modifier is present at 5 wt % to 60 wt %, or greater than 12 wt % to 55 wt %, of the lubricating composition.

19. A driveline device lubricated by the method of any one of the preceding claims.