

Title (en)
Lubricant formulations and methods

Title (de)
Schmiermittelformulierungen und -verfahren

Title (fr)
Formulations de lubrifiant et procédés

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Abstract (en)

The embodiments described herein relate to particular formulations and methods that may provide improved fuel economy characteristics for an engine lubricant. The compositions and methods include a (a) a base oil; (b) a zinc dialkyldithiophosphate compound; and (c) a hydrocarbon soluble metal compound. The hydrocarbon soluble metal compound is devoid of phosphorus and sulfur atoms and the metal is selected from the group consisting essentially of selected from the group consisting essentially of cobalt, nickel, zinc, zirconium, manganese, vanadium, scandium, yttrium, tungsten, gold, platinum, and iron. A weight ratio of total metal in the lubricant composition from the zinc dialkyl- dithiophosphate compound and the hydrocarbon soluble metal compound to phosphorus in the lubricant composition ranges from greater than 1.5 to 1 to 15 to 1.

IPC 8 full level

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Citation (applicant)

- US 3697574 A 19721010 - PIASEK EDMUND J, et al
- US 3736357 A 19730529 - PIASEK E, et al
- US 4234435 A 19801118 - MEINHARDT NORMAN A, et al
- US 4636322 A 19870113 - NALESNIK THEODORE E [US]
- US 3219666 A 19651123
- US 3565804 A 19710223 - HONNEN LEWIS R, et al
- US 5633326 A 19970527 - PATIL ABHIMANYU O [US], et al
- US 5936041 A 19990810 - DIANA WILLIAM B [US], et al
- US 5643859 A 19970701 - GUTIERREZ ANTONIO [US], et al
- US 5627259 A 19970506 - THALER WARREN A [US], et al
- US 5851965 A 19981222 - HARRISON JAMES J [US], et al
- US 5853434 A 19981229 - HARRISON JAMES J [US], et al
- US 5792729 A 19980811 - HARRISON JAMES J [US], et al
- US 4867890 A 19890919 - COLCLOUGH TERENCE [GB], et al
- US 2004266630 A1 20041230 - GEORGE HERMAN F [US], et al
- US 6599865 B1 20030729 - ESCHE JR CARL K [US], et al
- US 5693598 A 19971202 - ABRAHAM WILLIAM D [US], et al
- US 4876375 A 19891024 - LAM WILLIAM Y [US]
- US 4927552 A 19900522 - LAM WILLIAM Y [US]
- US 4957643 A 19900918 - LAM WILLIAM Y [US]
- US 4885365 A 19891205 - LAM WILLIAM Y [US]
- US 5789357 A 19980804 - BARANSKI JOHN R [US], et al
- US 5686397 A 19971111 - BARANSKI JOHN R [US], et al
- US 5902776 A 19990511 - DOHNER BRENT R [US], et al
- US 2786866 A 19570326 - HOOK EDWIN O, et al
- US 2710872 A 19550614 - THOMPSON RALPH B
- US 2384577 A 19450911 - THOMAS JOHN C
- US 2897152 A 19590728 - SCOTCHFORD ELLIOTT JOHN, et al
- US 3407222 A 19681022 - ANDREW LIES THOMAS
- US 3867359 A 19750218 - BEADLE HOWARD C
- US 4758362 A 19880719 - BUTKE BETSY J [US]
- US 6797677 B2 20040928 - ESCHE JR CARL K [US], et al
- US 4259195 A 19810331 - KING JOHN M, et al
- US 4261843 A 19810414 - KING JOHN M, et al
- US 4164473 A 19790814 - COUPLAND KEITH [CA], et al
- US 4266945 A 19810512 - KARN JACK L
- US 4889647 A 19891226 - ROWAN EUGENE V [US], et al
- US 5137647 A 19920811 - KAROL THOMAS J [US]
- US 4692256 A 19870908 - UMEMURA MASASHI [JP], et al
- US 5412130 A 19950502 - KAROL THOMAS J [US]
- US 6509303 B1 20030121 - GATTO VINCENT JAMES [US]
- US 6528463 B1 20030304 - GATTO VINCENT JAMES [US], et al
- US 3509051 A 19700428 - FARMER HOMER H, et al
- US 3356702 A 19671205 - FARMER HOMER H, et al

- US 4098705 A 19780704 - SAKURAI TOSHIO, et al
- US 4178258 A 19791211 - PAPAY ANDREW G [US], et al
- US 4263152 A 19810421 - KING JOHN M, et al
- US 4265773 A 19810505 - DEVRIES LOUIS, et al
- US 4272387 A 19810609 - KING JOHN M, et al
- US 4285822 A 19810825 - DEVRIES LOUIS, et al
- US 4369119 A 19830118 - DEVRIES LOUIS, et al
- US 4395343 A 19830726 - DE VRIES LOUIS, et al
- US 4283295 A 19810811 - DEVRIES LOUIS, et al
- US 4362633 A 19821207 - SPENCE J RONALD, et al
- US 4402840 A 19830906 - DEVRIES LOUIS [US], et al
- US 4466901 A 19840821 - HUNT MACK W [US], et al
- US 4765918 A 19880823 - LOVE DORIS [US], et al
- US 4966719 A 19901030 - COYLE CATHERINE L [US], et al
- US 4978464 A 19901218 - COYLE CATHERINE L [US], et al
- US 4990271 A 19910205 - FRANCIS JAMES N [US]
- US 4995996 A 19910226 - COYLE CATHERINE L [US], et al
- US 6232276 B1 20010515 - STIEFEL EDWARD IRA [US], et al
- US 6103674 A 20000815 - NALESNIK THEODORE E [US], et al
- US 6117826 A 20000912 - BARANSKI JOHN ROBERT [US], et al
- EP 0330522 A2 19890830 - EXXON CHEMICAL PATENTS INC [US]
- US 3794081 A 19740226 - FISER J, et al
- US 4029587 A 19770614 - KOCH FREDERICK WILLIAM

Cited by

CN111051479A; JP2020526634A; EP4134414A1; WO2019012447A1

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