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(54) Title: LUBRICANTS WITH OVERBASED CALCIUM AND OVERBASED MAGNESIUM DETERGENTS AND METHOD
FOR IMPROVING LOW-SPEED PRE-IGNITION

(57) Abstract: A lubricating oil composition and method of operating a boosted internal combustion engine. The lubricating oil includes greater than 50 wt.% of a base oil, one or more overbased calcium-containing detergents, one or more overbased magnesium-containing detergents and one or more molybdenum compounds and leads to a more than 60% reduction in LSPI compared to the LSPI of a reference oil and passes the Ball Rust Test. The ratio of wt% calcium from the overbased detergents to wt.% of magnesium from the overbased detergents is less than 11.9. A ratio of total ppm of magnesium to total TBN of the lubricating oil in mg KOH/g is greater than 19. A ratio of the total ppm of calcium to the total TBN of the lubricating oil is less than 222. The oil and method may reduce low-speed pre-ignition events in a boosted internal combustion relative to commercially available lubricating oils.



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