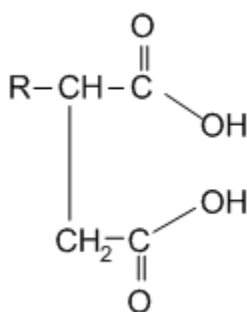


FUEL ADDITIVES FOR TREATING INTERNAL DEPOSITS OF FUEL INJECTORS

ABSTRACT

Methods for improving the injector performance, unsticking fuel injectors, and reducing an amount of alkali metal carboxylate deposits on internal components of fuel injectors. The method includes operating the diesel engine on a fuel composition comprising a major amount of diesel fuel and from about 45 to about 550 ppm by weight based on a total weight of fuel composition of a fuel additive consisting essentially of a compound of the formula



wherein R is an alkyl or alkenyl group containing from 20 to 170 carbon atoms. The additive has a total acid number (TAN) ranging from about 50 to about 290 mg KOH/g. Fuel injectors of the fuel injected diesel engine have an average injector hole diameter of less than 160 μm and an average smallest clearance between injector needle and injector barrel/casing of less than about 10 μm .

[No suitable Figure]