

**JAMA Position on the Market Introduction of  
Diesel Fuel Containing >5% FAME Blend Concentrations**

Fuel & Lubricants Subcommittee

Japan Automobile Manufacturers Association, Inc. (JAMA)

In support of efforts to reduce carbon dioxide (CO<sub>2</sub>) emissions and conserve fossil fuel resources and in view of the fact that fatty acid methyl esters (FAME) constitute a renewable energy source, the Japan Automobile Manufacturers Association, as stated in its preceding position statement released in October 2009, endorses the market supply of conventional diesel fuel blended with a maximum of 5% FAME (B5), provided that specific quality requirements are met prior to its delivery at the pump.

JAMA is very concerned, however, that diesel fuel-use policy in various Southeast Asian countries is increasingly calling for the market supply of diesel fuel blended with FAME concentrations in excess of 5%. The purpose of this position statement update is 1) to reiterate our concerns in this regard and to explain the possible negative impacts of using diesel fuel containing FAME concentrations of more than 5%; and 2) to respectfully request that government authorities, fuel suppliers and all other stakeholders concerned take the necessary actions to inform the public not only of any forthcoming market introduction of diesel fuel blended with greater than 5% FAME concentrations, but also of the possible risks involved in using such fuel in automobiles.

**Concerns & Risks in Regard to the Use of Diesel Fuel Containing >5% FAME**

■ **Material Compatibility**

FAME has characteristics similar to ester solvents and consequently may cause the rubber used in seals and hoses in fuel delivery systems to harden and become distended. Increases in FAME blend ratios in diesel fuel thus pose a potentially serious risk to the viability of rubber components in fuel delivery systems and in their design specifications-mandated performance, and could thereby result in fuel leakage.

■ **Solvency**

The solvency of FAME is similar to that of ester solvents and FAME solvency increases with higher ratios of FAME blendstock in diesel fuel. This increased solvency may loosen and even dissolve sediments in onboard fuel systems and in underground storage tanks at service stations, contributing to clogged filters (i.e. “filter plugging”) both in vehicles and in service-station fuel delivery systems.

■ **Oxidation Stability**

FAME has lower oxidation stability than petroleum-derived diesel fuel. When blended with diesel fuel, it can trigger the generation of acid and the formation of sludge. This degradation of biodiesel can adversely affect the materials and

components with which it comes into contact in fuel systems.

■ **Water Content**

FAME absorbs moisture (water) more readily than petroleum-derived diesel fuel and FAME's moisture content increases with its use in higher concentrations as a blendstock. This can increase the likelihood of free water appearing during storage and use in vehicles, which in turn would aggravate the adverse effects of acid and sludge present in biodiesel fuel, with material corrosion in fuel lines being a possible consequence.

■ **Contaminants**

FAME can contain microbiological contaminants from its feedstocks and other impurities generated during its manufacture, and the amounts of these contaminants increase with higher FAME blend concentrations in diesel fuel. Principal contaminants are monoglycerides and trace metals. Monoglycerides can lead to the formation of filter-plugging precipitates, while metals can accelerate the development of sludge and the formation of injector deposits. Sludge trapped by the fuel filter itself can also clog the filter. Injector deposits will restrict fuel flow to the engine, resulting in reduced engine power output. These developments are a matter of serious concern because they can jeopardize safe vehicle use, and their potential to do so increases with higher FAME content in diesel fuel blends.

**Summary of JAMA Position**

- ◆ Because of the potential risks to vehicles and their users, JAMA does not promote the market supply of diesel fuel blended with FAME at higher-than-recommended ratios.
- ◆ FAME concentrations in diesel fuel of 5% or less are acceptable. If FAME concentrations in diesel fuel in excess of 5% are being considered, JAMA strongly recommends that HVO (hydrotreated vegetable oil) and BTL (biomass-to-liquid) fuels should be used in addition to the use of FAME in concentrations not exceeding 5%.
- ◆ Conventional diesel fuel with containing less than 5% of FAME should be remained along with biodiesel fuel containing FAME concentrations in excess 5%. Moreover, National authorities and other relevant stakeholders should inform the public in a comprehensive and timely way whenever diesel fuel containing FAME concentrations in excess of 5% is to be provided to the market; at the same time, the public should be informed of the potentially negative impacts that the use of such fuel could have on motor vehicles.
- ◆ As with emissions and other automotive technical standards, relevant government entities should adopt specifications for market-bound fuel that comply with internationally harmonized standards. Moreover, compliance with vehicle emissions regulations must be taken into account in tandem with the adoption of fuel specifications.

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