

What are paraffinic fuels?

Paraffinic fuels are “clean diesel” fuels, with near zero sulphur and aromatics, and their use in diesel vehicles could lower emissions. They are made with the Fischer Tropsch process from natural gas (**GTL**) or biomass (**BTL**), or through a hydrotreatment process from vegetable oils or animal fats (**HVO**).

Gas-to-Liquids (GTL) fuels are produced from natural gas using the Fischer-Tropsch process.

Hydrotreated Vegetable Oil (HVO) is a renewable fuel made by a refinery-based process converting vegetable oils to paraffins. Animal fats are also suitable for feedstocks.

HVO is claimed to be the most environmentally friendly fuel as total CO₂ emissions (production of the fuel and emissions during burning in a diesel engine) are lowest.

Biomass-To-Liquids (BTL) Fischer-Tropsch process using biomass, such as woodchips, as feedstock to produce fuel.

Are paraffinic fuels regulated?

Yes, all paraffinic fuels must conform to EN 15940:2016. Traditional diesel conforms to EN 590:2013 European Ultra Low Sulphur Diesel (ULSD).

Do traditional diesel and paraffinic fuels differ?

Paraffinic fuels have a lower density than traditional diesel. However, the calorific value (Cetane number) is significantly higher. Overall, the energy per litre is slightly lower than traditional diesel.

Using paraffinic fuels in diesel engines reduces particulate matter (PM), NO_x, SO_x, and hydrocarbons (HC) compared to conventional diesel. Environmental impact is determined by the installed aftertreatment devices. Additionally, paraffinic fuels are claimed to reduce total CO₂ emissions and/or “tailpipe” emissions.

Is engine modification required to use paraffinic fuels?

No. Paraffinic fuels, conforming to EN 15940:2016, can be used in existing Komatsu, or Cummins, diesel engines without modification. Service intervals remain unaltered.



Who is requiring / using these fuels?

In some territories, agencies are encouraging use of paraffinic fuels in general, or specific paraffinic fuel types (e.g. HVO), as part of their drive to meet air quality emission targets.

In such territories, it is common that only paraffinic fuels are available on some job-sites.

What does “case by case” refer to for Cummins HHP engines?

For Cummins HHP engines, Cummins make checks (application, fuel etc) prior to confirming usage of paraffinic fuels. As a first step, please contact Komatsu Europe product management to initiate this process.

Some utility products use engines from manufacturers other than Komatsu and Cummins. What about those?

Komatsu approves use of paraffinic fuels in Komatsu, and Cummins (see note on Cummins HHP), engines.

Komatsu is seeking clarification from our other engine suppliers to confirm the status of their engines with respect to paraffinic fuel usage. We will provide an update in due course.

For clarity, the current products under review with other engine suppliers are:

PC09 ~ PC55
PC80MR-5
WB93R-8
WA100-8

Are paraffinic fuels ok for use in engines with DPF, SCR?

Yes. Approval to use covers engines equipped with or without DPF and with or without SCR aftertreatment systems. Key point is to ensure that fuel meets EN 15940:2016.

Use of paraffinic fuels (HVO, GTL, etc.) for Komatsu construction machine

Please inform the users to use fuel properly based on this Service Tips from now on, since we now have precautions on the use of paraffinic fuels (HVO, GTL, etc.).

Komatsu machines (Cummins engines or Komatsu engines) are certified to be in compliance with exhaust gas regulations using EU certified fuel. Paraffinic fuels are permitted as long as they are in compliance with EN 15940:2016 and ASTM D975.

⚠Caution

When using paraffinic fuels, their quality should be in compliance with the specifications described in this newsletter. Precautions in use, which have been described in this newsletter, should be observed. Otherwise it will damage the engine and fuel system.

[1. Paraffinic fuels terminology]

• Paraffinic fuels e.g.: Hydrogenated Vegetable Oil (HVO) Gas to liquids (GTL)	Diesel fuel is produced only from petroleum. Its components are paraffin and aromatic compounds. On the other hand, paraffinic fuel is produced from natural gas, coal, vegetable oil, animal and vegetable fats, etc. and its components are almost paraffin. Of these paraffinic fuels, vegetable oil and fat derived fuels are called renewable diesel (RD) or hydrogenated vegetable oil (HVO), and fuels synthesized from natural gas are called gas to liquids (GTL). Unlike biodiesel or fatty acid methyl ester (FAME), these paraffinic fuels have almost the same properties as diesel fuel. However, there is a risk of increase in fuel consumption as well as output decrease because the density is lower than that of diesel fuel and the heating value of fuel is low.
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[2. Warranty and the use of Paraffinic Biodiesel Fuel in Komatsu Machines]

Komatsu warrants for defects in raw materials and manufacturing. The warranty does not apply to any engine damage caused by paraffinic fuel usage which does not meet the specifications described in this newsletter, or to service issues and/or performance issues that do not arise from raw materials or manufacturing defects.

Paraffinic fuels of up to 100% blending ratio for Komatsu machines may be used.

The paraffinic fuels that are

subjected to quality assurance are to be in compliance with **EN 15940:2016 and ASTM D975.**

For paraffinic fuel for machines equipped with engines other than Komatsu engines or Cummins

engines, this recommendation does not apply. Please check the details from the relative resources.

Fuel hoses are important replacement parts. Please exchange it every 4000 hours or every 2 years --

whichever comes first.

For machines equipped with Cummins QSK45/50/60/78, this recommendation does not apply.

[3. Impact of paraffinic fuels]

Impact on output and fuel consumption.

• The fuel density of paraffinic fuel is up to 10% lower than normal diesel fuel. **It results in a slight decrease in power and a slight increase in fuel consumption.**

