

## **FAQ: The Use of Biodiesel with Cummins Automotive Engines**

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Interest in reducing national dependency on petroleum-based fuels has led to increased attention on biodiesel as a renewable, "alternative" non-petroleum based fuel for diesel engines. This FAQ sheet addresses some of the questions regarding its use with Cummins automotive engines in North America:

1. Which Cummins engines can be used with biodiesel?
2. Some vehicles already using higher than B5 - is this okay?
3. What's preventing you from moving to B20 and above?
4. Will your 2007 engines be biodiesel capable?
5. Is biodiesel more environmentally-friendly than standard diesel?
6. What fuel specifications are in place for biodiesel?
7. How does using biodiesel affect your engine warranty?
8. What is Cummins position on alternative fuels?
9. Are there any biodiesel mandatory requirements on the horizon?

### 1. Which Cummins engines can be used with biodiesel?

Cummins has completed evaluations which enable us to confirm that B5 biodiesel blend is suitable for use with the full range of Cummins automotive engines in North America, covering applications in truck, bus, motorhome and the Dodge Ram pickup truck.

B5 is a fuel blend of 5 percent pure biodiesel with 95 percent standard petroleum diesel. No modification to the engine is needed to enable it to operate on B5 biodiesel and no impact on engine performance, durability or maintenance is anticipated with its use. Users of B5 biodiesel should ensure that the fuel is of a consistent, high quality standard appropriate for that of a high performance Cummins diesel engine.

### 2. Some vehicles are already using higher than B5 - is this okay?

Cummins can only confirm at this point that biodiesel no higher than 5 percent blend (B5) is suitable for use with our engines. We would advise our customers not to use anything above B5 levels with a Cummins engine until our evaluations are completed.

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3. What's preventing you from moving to B20 and above?

Cummins is evaluating the potential for concentrations of biodiesel higher than 5% for products to be released in 2006. We are aware of the growing interest in B20 fuel blends of 20%. As we reach conclusions and the completion of these customer evaluations, we will modify our position on engine compatibility accordingly.

The main barrier to moving beyond B5 is the lack of an industry agreed fuel standard for biodiesel in terms of fuel consistency and stability, which has resulted in product performance issues such as fuel filter plugging. This becomes essential when moving beyond the relatively low blend level of B5. Our main consideration is to ensure the engine will continue to offer the same high levels of performance and dependability our customers expect from Cummins.

4. Will your 2007 engines be biodiesel capable?

Cummins current engine platforms will all move forward to meet the forthcoming 2007 emissions standards in combination with the introduction of Ultra Low Sulfur Diesel (ULSD) fuel at the 15 ppm level regulated by the EPA. As these engines will be essentially the same as our current products they will continue to offer B5 biodiesel capability at 2007. The B5 biodiesel fuel used with our 2007 engines will need to conform to the same 15ppm sulfur content level as the ULSD fuel to ensure there is no adverse affect on the Diesel Particulate Filter aftertreatment.

Much of this 2007 interest has focused on using twenty percent B20 biodiesel. With an agreed fuel specification meeting the necessary quality standard in place, there is an opportunity for engine companies to aim for this level of compatibility. Cummins is evaluating the potential for concentrations of biodiesel higher than 5% for our products ahead of the 2007 emissions timeframe. As we reach conclusions with ongoing evaluations, we will modify our position on engine compatibility accordingly.

5. Is biodiesel more environmentally-friendly than standard diesel?

In terms of exhaust emissions from the engine, the use of biodiesel at various blend levels is not yet fully understood. There are indications that PM (Particulate Matter) and HC (Hydrocarbons) emissions may be reduced - but NOx (Oxides of Nitrogen) levels may be marginally increased. Therefore the overall exhaust emissions impact of using biodiesel may prove to be very close to that of using standard diesel. Our engines must meet stringent EPA emission regulations - and by 2007 this means we will be reducing PM by 90 percent based on using ULSD fuel.

The major benefit of using biodiesel is that it is environmentally sustainable. As a natural substance, mostly derived from Soybean and other oil seed crops it is renewable and biodegradable. Biodiesel also offers an opportunity to reduce the nation's dependency on imported oil and ensure greater energy security.

6. What fuel specifications are in place for biodiesel?

The industry is aware of significant variations in biodiesel specifications and quality, particularly with regard to consistency and fuel stability. As the production and distribution of biodiesel has grown so dramatically it has outpaced the ability of the industry to conduct the appropriate engine performance and fuel specification evaluations.

This has been further complicated by the wide variety of blend percentages available. Cummins is undertaking evaluation programs focused on establishing an agreed industry standard of biodiesel fuel consistency and quality. The program is running in conjunction with the National Biodiesel Board (NBB) and the ASTM (American Society for Testing and Materials).

It should be emphasized that Cummins, in common with all other engine manufacturers, emission certifies engines only to meet the prescribed EPA (or other local regulatory agency) registered fuels for on-highway applications. It is the engine user's responsibility to use the correct fuel prescribed by these regulations and as recommended by the engine manufacturer.

The EPA has regulated the nation's highway diesel fuel quality since 1993 to ensure it is compatible with meeting engine emissions standards and air quality goals. It is the responsibility of the user to obtain the proper local, regional, or national exemptions required for the use of biodiesel in any emissions regulated Cummins engine.

7. How does using biodiesel affect your engine warranty?

The use of biodiesel does not affect the Cummins materials and workmanship warranty. However, any engine failure or performance issue caused by the use of biodiesel or other fuel additives cannot be considered as defects of the Cummins engine, components or workmanship - and would therefore not be covered by Cummins warranty.

This is no different from our position with any regular diesel fuel. Cummins does not cover the damage caused by products from other companies that may have insufficient quality. It is important to ensure when using any diesel fuel or a B5 biodiesel blend with a Cummins engine that the fuel meets industry acceptable quality standards.

8. What is Cummins position on alternative fuels?

Cummins fully supports the use of environmentally beneficial alternative fuels. Our full range of truck, bus and RV engines are compatible with operating on B5 biodiesel to help encourage the greater use of renewable, domestically grown fuel. In May 2005 we announced B5 biodiesel capability for the Cummins Turbo Diesel available in the popular Dodge Ram pickup truck, bringing the option of using this fuel to a much wider range of customers.

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We are by far the largest supplier of natural gas fueled engines in North America through our Cummins Westport joint venture, who are also undertaking important development work on Hydrogen Compressed Natural Gas (HCNG) engines. Cummins has played a leading role in the emerging technology of diesel-electric hybrid buses, providing an environmentally friendly and fuel-efficient solution for transit operations in U.S. cities and national parks

9. Are there any biodiesel mandatory requirements on the horizon?

We understand that several States and municipalities in the US are considering mandating the use of low level levels of biodiesel in diesel fuel. We are also aware that the Provincial Government in Ontario, Canada has discussed the possibility of making biodiesel mandatory for commercial vehicles.

If mandatory requirements are introduced, these must first take into account the need for biodiesel fuel specifications with agreed consistency and quality standards. Also, at this point, Cummins cannot confirm the suitability of our engines for biodiesel blends above five percent (B5).

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