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Biodiesel Fuel in John Deere Tractors

Symptoms

Using biodiesel fuel in your John Deere tractor.

Situation or Problem

Biodiesel fuels are formulated in many different blends and concentrations.

Solution Steps

Biodiesel fuels may be used in John Deere diesel engines only if the fuel meets the provisional ASTM (German) specification listed in Table A, see below.

NOTE: Raw pressed vegetable oils are **NOT** acceptable for use for fuel in any concentration. These oils will cause engine failure by leaving deposits on injectors and in the combustion chamber.

While a major environmental benefit of a biodiesel fuel is its ability to biodegrade, users must recognize that proper handling is of prime importance as indicated below:

- Ensure the quality of the biodiesel fuel (fuel meets the specifications in Table A).
- Keep storage and vehicle tanks as full as possible to prevent moisture from collecting inside.
- Ensure all tank caps and covers are installed properly to prevent water from entering.
- Monitor water content of the fuel regularly (Bonds with water, creating acids).
- Limit the storage tanks from extreme temperatures (i.e. Direct sun or frost).
- Limit the storage to 3 months due to shelf life (degrades quickly, microbes, oxidation).
- Wash down spills with clean water immediately to prevent corrosion and damage to paint.
- Fuel filter may need to be replaced more often due to premature plugging.
- Check engine oil sump level daily prior to starting, a rising level may indicate lubricating oil dilution all engines and even more critical for engines equipped with rotary fuel injection pumps.
- Instability resulting from blending biodiesel with mineral diesel fuel.
- Consult your fuel supplier for additives to improve storage and performance of biodiesel fuels.

Blending biodiesel fuel above a 5% concentration could have some adverse affects to the engine, such as:

- Power loss and deterioration of performance
- Fuel leakage through seals and hoses
- Corrosion of fuel injection equipment
- Lubricity of biodiesel and the fuel injection equipment
- Coked/blocked injector nozzles, leading to poor atomization of fuel
- Filter plugging
- Lacquering/seizure of internal injection system components
- Sludge and sediments
- Reduced service life

When using a blend of biodiesel fuel in a rotary fuel injection pump, the engine oil level must be checked when the temperature is -10° C (14° F) or lower. If oil becomes diluted with fuel, oil change intervals must be established by using OilScan™ /OilScan Plus™ programs.

Another factor due to cold temperatures is the cloud point of the fuel. When blending biodiesel the temperature at which the fuel will start to cloud is changed, Consult your fuel supplier for biodiesel cloud point specification.

John Deere product warranty only covers defects in material and workmanship as manufactured and caused by the use of biodiesel fuels or other fuel additives are not defects of workmanship and/or material. John Deere, and cannot be compensated under John Deere warranty. Users of John Deere emission certified engines must consult their local, state, and national exemptions required for the use of biodiesel. See Product Manual for Biodiesel Fuel (B100) in Table A.

NOTE: Experience shows that biodiesel is not always conforming to standards defined. In addition, the standards in Table A are broadly defined which results in variation of the biodiesel quality.

The FAME fuel composition can vary in quality. This variation of quality can cause fuel injection system

IMPORTANT: The operator must ensure the supply of qualified biodiesel used, does not harm any p system.

See your local John Deere Dealer for additional information.

Table A
Biodiesel
Specification

Table A

Provisional Specifications for Biodiesel Fuel (B100)		
Property	Unit	ASTM PS121-99
Density at 15° C (59° F)	g/cm ³ (lb/ft ³)	
Viscosity at 40° C (104° F)	mm ² /s (cST)	1.9 - 6.0
Cloud Point	°C (°F)	Report to Customer
Flash Point	°C (°F)	Min. 100
Total Sulfur	% Mass	Max. 0.05
Cetane Number	—	Min. 40
Ash Content	% Mass	Max. 0.02
Water Content	% Mass	Max. 0.050
Copper Corrosion (3 hours, 50° C) (3 hours, 122° F)	Degree of Corrosion	No. 3 Max.
Free Glycerin	% Mass	0.02 Max.
Total Glycerin	% Mass	0.240 Max.
Carbon Residue 100% sample	% Mass	0.05 Max.
Acid Number	mg KOH/g	0.80 Max.
Total Contamination	% Mass	
Neutralization Value	mg KOH/g	
Methanol Content	% Mass	
Monoglycerides	% Mass	
Diglycerides	% Mass	
Triglycerides	% Mass	
Iodine Number	—	
Phosphorus	% Mass	
Alkali Content (Na + K)	% Mass	
(Cold Filter Plugging Point)— Summer	°C (°F)	
(Cold Filter Plugging Point)— Winter	°C (°F)	

Affected Equipment

Model: 7200
 Model: 7210
 Model: 7220
 Model: 7320
 Model: 7400
 Model: 7410
 Model: 7405
 Model: 7420
 Model: 7510
 Model: 7520
 Model: 7600
 Model: 7610
 Model: 7700
 Model: 7710
 Model: 7800
 Model: 7810
 Model: 8100
 Model: 8200
 Model: 8300
 Model: 8400
 Model: 8110

Model: 8210
Model: 8310
Model: 8410
Model: 8120
Model: 8220
Model: 8320
Model: 8420
Model: 8520
Model: 8110T
Model: 8210T
Model: 8310T
Model: 8410T
Model: 8120T
Model: 8220T
Model: 8320T
Model: 8420T
Model: 8520T
Model: 9100
Model: 9200
Model: 9300
Model: 9400
Model: 9120
Model: 9220
Model: 9320
Model: 9420
Model: 9520
Model: 9300T
Model: 9400T
Model: 9320T
Model: 9420T
Model: 9520T



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