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DETROIT™ BIODIESEL POLICY:

What is Biodiesel?

The term “Biodiesel” (B100) refers to a first generation biofuel that consists of medium to long chain fatty acid methyl esters (FAME) and is typically made from vegetable oil, animal fats, used cooking oil and greases. This fuel is typically made from a process known as trans-esterification and is generally blended at a rate of 5-20% (B5-B20) by total volume with petroleum based diesel.

Biodiesel is not ‘Renewable Diesel’. Renewable diesel (R100/BTL/HVO) is an alternate biofuel that can be made from the same renewable feedstock as biodiesel. Detroit Diesel has approved renewable diesel up to 100% blend rates. Refer to the [Detroit Diesel™ Renewable Diesel Policy](#) statement for details.

NOTE: Raw Vegetable Oil and similar triglycerides are not permissible in all DETROIT™ or MBE engines as a blendstock, additive, or contaminant.

ENGINE COMPATIBILITY:

Detroit® highly recommends that any fuel used meet the specifications listed in this document and in Table 2.

Furthermore, specific to engine families, Detroit® approves the use of biodiesel fuel blends as follows:

Table 1:			Maximum biodiesel blend
DD Platform	2024 model year and later	CARB certified	20%
		US EPA certified	5%
	Prior to 2024 model year	All	5%
MBE 900 & 4000	All model years	All	5%
Series 60	2004 model year and later	All	20%
	Prior to 2004 model year	All	5%

Engines listed above must use fuels conforming at a minimum to specifications listed in BIODIESEL FUEL QUALITY REQUIREMENTS Section. Other fuels or biodiesel levels are prohibited.

Detroit does not approve biodiesel blends in excess of 20%. Detroit does not warrant damage caused by the use of unapproved fuels.

In addition to the engine compatibility, Detroit Diesel recommends the following:

- Follow the oil change intervals published Lubricating Oil and Filters manual. (DDC-SVC-BRO-0001)
- Biodiesel blends are less stable than diesel fuel and should not be stored for more than 1 month.
- Whenever possible purchase fuel from retailers that sell TOP TIER Diesel Fuel. See toptiergas.com for more information.
- Fuel supplier should confirm requirements; always monitor the Certificate of Analysis from each batch of fuel.
- Biodiesel is not compatible with certain sealing materials, such as nitrile and butyl rubber, or yellow metals, such as copper, bronze and brass, or lead, zinc or galvanized iron.

BIODIESEL FUEL QUALITY REQUIREMENTS:

- Biodiesel blends up to 5% (B5) must meet ASTM D975, or CAN/CGSB- 3.520 at a minimum.
- Biodiesel blends from 6% to 20% (B6-B20) must meet ASTM D7467 or CAN/CGSB-3.522 at a minimum.
- Biodiesel blendstock (B100) must meet ASTM D6751, CAN/CGSB-3.524, or EN 14214 at a minimum.

BIODIESEL FUEL QUALITY RECOMMENDATIONS:

Please see DETROIT™ recommendations detailed in Table 2. For further information regarding biodiesel recommendations, please see Fuels Brochure (DDC-SVC-BRO-0120).

Detroit recommends the use of Top Tier™ Diesel Fuel for use in Detroit Engines. This standard is a voluntary retailer program that has supplemental requirements that exceed ASTM standards. It also has provisions for quality control of the fuel distribution. Look for the Top Tier™ logo at retailers, as this fuel will generally meet all Detroit recommendations. (toptiergas.com)



Fuel Property	Test Method	#1 or #2 Diesel Fuel & B5	³ B6-B20 Blends	B100
Base Specification for fuel	-	ASTM D975 or CAN CGSB 3.520	ASTM D7467 or CAN CGSB 3.522	ASTM D6751 or CAN CGSB 3.524 or EN14214
Biodiesel Content, % (V/V)	ASTM D7371 / EN 14103	≤ 5	6-20	100
Total Water Content, ppm	ASTM D6304 / EN 12937	200	200	200
Sediment, ppm	ASTM D2276	24	24	24
Copper strip corrosion rating, max (3 h at a minimum control temperature of 50°C)	ASTM D 130	No. 1	No. 1	No. 1
Lubricity, HFRR @ 60°C, micron, max	ASTM D6079 / EN 12156-1	460	460	-
Conductivity, pS/m or Conductivity Units (C.U.), min	ASTM D2624 OR D4308	25	-	-
Acid Number, mg KOH/g, max	ASTM D664 OR D974 / EN 14104	0.08	0.1	0.3
Oxidation Stability, hours, min	EN 15751	>24	>20	>8
Oxidation Stability, PetroOXy Test, min	ASTM D7545	>60	-	-
Calcium & Magnesium Combined, ppm	EN 14538	<1	<1	2
Sodium & Potassium Combined, ppm	EN 14538	<1	<1	2
Phosphorus Content, %mass, max	ASTM D4951	<1	<1	4
Free Glycerin, % mass	ASTM D6584 / EN14105	-	-	0.02
Total Glycerin, % mass	ASTM D6584 / EN14105	-	-	0.24
Glyceride Content	EN14 105	Mono	-	0.80%
		Di	-	0.20%
		Tri	-	0.20%

Table 2: Supplemental Fuel Property Recommendations for Detroit engines

WARRANTY IMPLICATIONS:

Using biodiesel blends does not automatically void Detroit Diesel's warranty. However, any failure, including after-treatment devices and fuel injection system failures, determined to be caused by fuels that fail to meet industry requirements documented in this publication will not be covered by Detroit Diesel warranty.

Biodiesel blends above those specified in the tables above, based on engine type and model year, create additional risk of poor fuel quality leading to potential component failures such as the failures listed in the Biodiesel Additional Cautions Section of this document. Use of biodiesel blends above those specified for each engine, based on its engine type and model year, may invalidate warranties.

Detroit Diesel is not responsible for any cost arising from a failure to properly perform required maintenance oil, lubricants, and coolants meeting Detroit Diesel-recommended specifications. Performance of required maintenance and use of proper oil, lubricants, and coolants are the responsibility of the owner. For full details, see the engine operator's guide for your engine.

Additive Statement

The use of supplemental fuel additives does not necessarily void the engine warranty. However, warranty and repair expenses which are determined, by Detroit Diesel or its representative, to have resulted from a fuel additive will not be covered.

Detroit™ will not test or verify the performance of any aftermarket additives. It will not accept responsibility for the use, selection, or hazards relating to the use of such products.

ADDITIONAL CAUTIONS:

Fuel Filter Plugging:

- If using biodiesel blends higher than 5%, fuel filters should be changed at ½ the recommended service intervals published in the engine Owner's Manual. This is due to accelerated filter plugging from glycerides.
- Due to biodiesel's solvency, it can clean fuel systems and deposit debris on filters and lead to premature plugging immediately after switching to biodiesel.
- Fuel filter replacement is not covered under Detroit Diesel warranty. Detroit Diesel recommends the use of genuine Detroit Diesel fuel filters.
- Secondary fuel system hardware failures attributable to premature fuel filter plugging with biodiesel blends are not covered under Detroit Diesel warranty.

Storage & Oxidative Stability:

- Biodiesel blends are less stable than diesel fuel and should not be stored for more than 1 month.
- Biodiesel blends are not suitable for applications involving low frequency use.
- Before parking an engine for an extended time period, the fuel system must be purged of all biodiesel blends and flushed with petroleum diesel fuel.

Compatibility with After-treatment Systems:

- Biodiesel blends contaminated with phosphorus, alkali (Na and K) or alkaline (Ca and Mg) metals, over the specification limits, may lead to premature poisoning and plugging of after-treatment devices.
- Biodiesel blends greater than B20 may reduce the performance of the diesel oxidation catalyst and may result in the use of more parked particulate filter regeneration.

Cold Weather Performance:

- Use of biodiesel blends above 5% is not recommended in colder regions.
- The cloud point and cold filter plugging point (CFPP) properties of the fuel on the Certificate of Analysis should be regularly monitored and compared to expected ambient temperature to be encountered in use.
- Cold flow or anti-gel additives may respond differently to biodiesel blends; consult with the fuel supplier to determine actual performance.

Water Contamination:

- Water is more difficult to separate from biodiesel as compared to diesel fuel. This significantly reduces water separator efficiency. More frequent changes of coalescing filters may offset the reduced water separation efficiency.
- Excessive water contamination may lead to corrosion in fuel system and promote microbe growth.
- Fuel injection system failure due to corrosion caused by use of biodiesel fuel blends will not be covered by Detroit Diesel warranty.

Microorganism Growth:

- Biodiesel has an increased tendency for microbial growth.
- Microbial contamination may cause premature fuel filter plugging and/or corrosion in the fuel system.
- Laboratory testing for microbial growth is available. Fuel samples must be collected from the bottom of the tank (water layer) to accurately detect the microbes.

Engine Oil Analysis:

- Using biodiesel blends may require reduced engine oil drain intervals. Strictly follow the oil change intervals published Lube Oil and Filters manual (DDC-SVC- BRO-0001).
- Biodiesel may accelerate acid formation in the engine oil.
- Biodiesel fuel dilution is very harmful to the engine oil and will not evaporate from the engine oil as easily as diesel fuel.
- Biodiesel fuel dilution will reduce the oil viscosity and accelerate oil degradation, requiring reduced oil drain intervals.
- Used oil analysis is required for the first few oil changes after converting to biodiesel blends to check for fuel dilution and to confirm the proper oil drain interval. A Detroit Genuine Oil Analysis Program is recommended.