



**Zemo  
Partnership**  
Accelerating Transport to Zero Emissions

# Heavy Duty Vehicle Manufacturer Engine Approval for High Blend Biofuels

Appendix 1 - Renewable Fuels Guide

July 2023

[Zemo.org.uk](http://Zemo.org.uk)



Zemo Partnership is a public-private partnership working to accelerate a sustainable shift to low carbon fuels and zero emission vehicles. Around 240 organisations are engaged from diverse backgrounds including automotive and fuel supply chains, vehicle users, academics, environment groups and others. Zemo Partnership runs a Fuels Working Group comprised of sixty organisations from across the renewable fuels value chain. The organization also manages the Renewable Fuels Assurance Scheme.

### **Zemo Partnership**

3 Birdcage Walk, London, SW1H 9JJ

**T:** +44 (0)20 7304 6880

**E:** Hello@Zemo.org.uk

**Visit:** Zemo.org.uk

Appendix 1 accompanies Zemo's [Renewable Fuel Guide 2023](#) and specifically relates to the use of higher blends of biodiesel and renewable diesel in HGVs.

#### **Disclaimer**

This document outlines the approval position for different heavy-duty vehicle manufacturers for high-blend biodiesel and renewable diesel. The information provided is for general information purposes only. We do not accept responsibility or liability for any errors and omissions – use of this document is at your own risk. This information has been sourced from vehicle manufacturer's website and direct communication. We strongly recommend you contact your vehicle manufacturer to confirm your HGV model is approved to operate on either high-blend biodiesel or renewable fuels, and any impact it may have on warranty agreements.

# Contents

Fuel Quality Standards Covered	4
Glossary of Abbreviations	4
Biodiesel Blends	5
Paraffinic Diesel	11

---

## Fuel Quality Standards Covered

Standard	Fuel
EN 590	Retail Diesel
EN 16734	B10 - FAME/Biodiesel
EN 16709	B20/30 - FAME/Biodiesel
EN 14214	B100 - FAME/Biodiesel
EN 15940	Paraffinic Diesel including Renewable Diesel

## Glossary of Abbreviations

<b>FAME</b>	Fatty Acid Methyl Ester	<b>XTL</b>	Power to Liquid (Renewable synthetic diesel)
<b>HVO</b>	Hydrotreated Vegetable Oil	<b>CTL</b>	Coal to Liquid
<b>GTL</b>	Gas to Liquid	<b>BTL</b>	Biomass to Liquid

## Biodiesel Blends

OEM	Biodiesel Blend	Model	Engines	Comments
Cummins	B20 (without engine modifications)	-	<u>Euro VI:</u> B4.5 B6.7	-
DAF	B20 / B30 to EN 16709	New Generation DAF (NGD)	MX-11 / MX-13 (Euro VI)	Euro V "EEV" type vehicles (equipped with passive soot filter) have a maximum of 7% biodiesel (B7).  Euro III vehicles retrofitted with a passive soot filter have a maximum of 7% biodiesel (B7).  Vehicles <b>before</b> chassis number OE552890 (CF75/85 vehicles with PE and XE engines) have a maximum of 7% biodiesel (B7).
		Model Year 2017 CF / XF	MX-11 / MX-13 (Euro VI)	
		LF / CF	PX-4 / PX-5 / PX-7 (Euro VI) ( <b>maximum B20</b> )	
		CF85 – XF105	MX (with adaptations) (Euro IV/V)	
		CF75	PR (with adaptations) (Euro IV/V)	
		LF & CF65	FR – GR (Euro IV/V) ( <b>maximum B20</b> )	
		CF85 ( <b>after</b> chassis number OE552891) – XF95	XE (Euro III)	

OEM	Biodiesel Blend	Model	Engines	Comments
DAF	B20 / B30 to EN 16709	CF75 ( <b>after</b> chassis number 0E552891)	PE (Euro III)	Euro V "EEV" type vehicles (equipped with passive soot filter) have a maximum of 7% biodiesel (B7).  Euro III vehicles retrofitted with a passive soot filter have a maximum of 7% biodiesel (B7).  Vehicles <b>before</b> chassis number 0E552890 (CF75/85 vehicles with PE and XE engines) have a maximum of 7% biodiesel (B7).
		LF and CF65	BE – CE (Euro III) ( <b>maximum B20</b> )	
	B100 to EN 14214	CF85 – XF105	MX (with adaptations) (Euro IV/V)	
		CF75	PR (with adaptations) (Euro IV/V)	
		CF85 ( <b>after</b> chassis number 0E552891) – XF95	XE (Euro III)	
		CF75 ( <b>after</b> chassis number 0E552891)	PE (Euro III)	
IVECO	-	-	-	To our knowledge, no current products are approved beyond a maximum 7% blend (B7).
Mercedes-Benz	EN 14214 (plus admixtures with EN 590)	Actros and Arocs (Construction years 2014 – 2018) The Antos (Euro VI)	Only BlueTec vehicles with OM471 engines (code M0W). A special fuel prefilter (code M8Y) must be fitted.	-

OEM	Biodiesel Blend	Model	Engines	Comments
<b>Mercedes-Benz</b>	Pure FAME, and a mixture with conventional diesel is permitted.	The Actros and Arocs (Construction years 1996 – 2013) The Atego (Construction years 1998 – 2012) The Axor	-	-
<b>Renault</b>	B30	Truck Range D	5L, 240 HP for Variant 12109	For biodiesel compatibility, a specific variant must be selected at the time of order. Renault's Master and Traffic rangers are incompatible with biodiesel.  Engines are assumed to be Euro VI.
		Truck Ranges D Wide, C 2.3M	8L 320 HP for Variant 12109.	
	B100	Truck Range D	5L, 240 HP for Variants 12108 & 12111	
		Truck Ranges D Wide, C 2.3M	8L 320 HP for Variants 12108 & 12111	
		Truck Ranges T High, T, C, K	13L, 480 HP for Variants 12108 & 12111	
<b>Scania</b>	Biodiesel option available (to EN 14214)	G-Series	<u>Euro VI:</u> DC13 (166, 165, 164, 163) OC13 101 DC09 (141 – 360 Hp, 140, 139)	See below.

OEM	Biodiesel Blend	Model	Engines	Comments
Scania	Biodiesel option available (to EN 14214)	L-Series	<p><u>Euro VI:</u> DC09 (140, 139) DC07 (113, 112, 111)</p>	<p>Adaptions to the engine's fuel system must be made for a Euro VI vehicle to run on any blend containing more than 10% biodiesel (B10 to B100), with an increase in service interval frequency. For Euro V and below, engines must also be adapted (for maintenance intervals and fuel filters) to run on biodiesel to EN 14214.</p> <p>Emergency vehicles, buses with HPI engines, vehicles with downtimes for more than 2 months, and industrial engines with XPI engines are not approved for biodiesel.</p>
		P-Series	<p><u>Euro VI:</u> DC09 (141, 140) DC13 (165, 164, 163) Super 13-litre (FAME) 500 Hp and 460 Hp</p> <p><u>Euro V:</u> 7-litre (280 Hp, 250 Hp, 220 Hp) 9-litre (360 Hp, 320 Hp, 280 Hp) 13-litre (450 Hp, 440 Hp, 410 Hp, 380 Hp)</p> <p><u>Euro IV:</u> 9-litre (360 Hp, 320 Hp, 280 Hp) 13-litre (450 Hp, 440 Hp, 410 Hp, 380 Hp)</p> <p><u>Euro III:</u> 9-litre (310 Hp, 250 Hp) 13-litre (460 Hp, 410 Hp, 360 Hp)</p>	
		R-Series	<p><u>Euro VI:</u> DC16 (121)</p>	



OEM	Biodiesel Blend	Model	Engines	Comments
Scania	Biodiesel option available (to EN 14214)	R-Series	<p>Super 13-litre (FAME) (500 Hp, 460 Hp)  DC13 (165, 164, 163)  DC09 (141 – 360 Hp, 140)</p> <p><u>Euro V:</u>  9-litre (360 Hp, 320 Hp, 280 Hp)  13-litre (540 Hp, 500 Hp, 450 Hp, 440 Hp, 410 Hp, 380 Hp)  16-litre (620 Hp, 520 Hp)</p> <p><u>Euro IV:</u>  9-litre (360 Hp, 320 Hp, 280 Hp)  13-litre (500 Hp, 450 Hp, 440 Hp, 410 Hp, 380 Hp)  16-litre (620 Hp, 520 Hp)</p> <p><u>Euro III:</u>  9-litre (310 Hp, 250 Hp)  13-litre (460 Hp, 410 Hp, 360 Hp)  16-litre (560 Hp)</p>	<p>Adaptions to the engine's fuel system must be made for a Euro VI vehicle to run on any blend containing more than 10% biodiesel (B10 to B100), with an increase in service interval frequency. For Euro V and below, engines must also be adapted (for maintenance intervals and fuel filters) to run on biodiesel to EN 14214.</p> <p>Emergency vehicles, buses with HPI engines, vehicles with downtimes for more than 2 months, and industrial engines with XPI engines are not approved for biodiesel.</p>
		S-Series	<p><u>Euro VI:</u>  DC16 (121)  Super 13-Litre (FAME) (500 Hp, 460 Hp)  DC13 (165, 164, 163)</p>	

OEM	Biodiesel Blend	Model	Engines	Comments
Scania	Biodiesel option available (to EN 14214)	Crewcab	<u>Euro VI:</u> DC13 (165, 164, 163) DC09 (141 – 360 Hp, 140)	See above.
		V8	V8 Powertrain (590 Hp) (Euro VI)	
		XT	<u>Euro VI:</u> 16-litre (590 Hp, 580 Hp) 13-litre (500 Hp, 450 Hp, 410 Hp – Torque 2150 Nm) 9-litre (360 Hp, 320 Hp) 7-litre (280 Hp, 250 Hp, 220 Hp)	
Volvo	B100	Truck FE	D8K 320 (Euro VI) variant available	For biodiesel compatibility, engines must be uniquely selected at the time of order.
		Truck FL	D8K 320 (Euro VI) variant available D5K 240 (Euro VI) variant available.	

## Paraffinic Diesel

OEM	Paraffinic Diesel	Model	Engines	Comments
Cummins	HVO (to EN 15940, assumed)	-	<u>Euro VI:</u> B4.5 B6.7	-
DAF	XTL (HVO/GTL/BTL/CTL) according to EN 15940	New Generation DAF (NGD)	MX-11 / MX-13 (Euro VI)	All non-Euro VI vehicles can use paraffinic diesel in compliance with EN 15940.
		Model Year 2017 CF / XF	MX-11 / MX-13 (Euro VI)	
		LF / CF	PX-4 / PX-5 / PX-7 (Euro VI) (for OBD-C-D-E compliant vehicles only)	
		CF85 – XF	MX (with adaptations) (Euro IV and V)	
		CF75	PR (with adaptations) (Euro IV and V) PE (Euro III and earlier)	
		LF and CF65	FR – GR (Euro IV and V) BE – CE (Euro III and earlier)	

OEM	Paraffinic Diesel	Model	Engines	Comments
DAF	See above.	95XF	XE (Euro III and earlier)	See above.
		CF85 – XF95	XE (Euro III and earlier)	
IVECO	XTL / HVO according to EN 15940 (2nd generation / non-crop based biofuels)	S-Way	Cursor 13 (340 to 570 Hp) (Euro VI) Cursor 11 and Cursor 13 engines (no technical changes necessary) (unknown Euro Standard)	-
		X-Way	Cursor diesel engine EVI family (Euro VI)	
		X-Way EVI Step D and above	Cursor 11 and Cursor 13 engines (no technical changes necessary) (unknown Euro Standard)	
		EUROCARGO EVI Step E	Tector 5 and Tector 7 Step E engines (Euro VI) (Use may increase Maintenance and Repair contracts)	
Mercedes-Benz	See below.	Actros and Acros (Construction years: 2014 – 2018)	OM470 OM471 OM473	-

OEM	Paraffinic Diesel	Model	Engines	Comments
Mercedes-Benz	Alternative diesel fuels according to EN 15940 (HVO/BTL/GTL/CTL)	The Antos	OM936	-
		The Atego (Construction from 2013)	OM934 OM936	
Renault	XTL / HVO (synthetic fuels, HVO/CTL/GTL/BTL) to EN 15940	Truck Range D & D Wide	DTI 5 and DTI 8 (Euro VI)	*Renault is comfortable with the use of HVO on these engines, despite a lack of clarity in Pre Euro VI regulation for alternative fuels, particularly concerning emission durability and no specific certification requirements. There are impacts on torque, and BSFC (for mass and volume).
		Truck Ranges T, C, & K	11 and 13lt (Euro VI)	
		-	<u>Euro V &amp; Euro V-EEV</u> (Possible for*): DTI 5 DTI 8 DTI 11 DTI 13 <u>Euro VI-B:</u> DTI 5 DTI 8 <u>Euro VI-C &amp; Euro VI-D:</u> DTI 5 DTI 8 DTI 11 DTI 13	

OEM	Paraffinic Diesel	Model	Engines	Comments
Scania	HVO to EN 15940	G-Series	<p><u>Euro VI:</u> DC13 (165, 164, 163) DC09 (141 - 360 Hp, 140)</p>	<p>Approved for use in trucks and buses, for Euro III, Euro IV, Euro V, and Euro VI engines. Exception: DC07 101 (which is not approved for mixtures of HVO to EN 15940)</p> <p>Vehicles with a lower chassis serial number than the ones below are <b>not</b> permitted to run on HVO:</p> <ul style="list-style-type: none"> <li>▪ Production site Angers, chassis serial numbers: 9172513 (engines DC09, DC12, DC13) and 9172445 (engine DC16).</li> <li>▪ Production site Södertälje, chassis serial numbers: 2082023 (engines DC09, DC12, DC13) and 2081940 (engine DC16).</li> <li>▪ Production site Zwolle, chassis serial numbers: 5307129 (engines DC09, DC12, DC13) and 5306936 (engine DC16).</li> </ul>
		L-Series	<p><u>Euro VI:</u> DC09 (140) DC07 (113, 112, 111)</p>	
		P-Series	<p><u>Euro VI:</u> DC07 (113, 112, 111), DC09 (141, 140, 139) DC13 (165, 164, 163, 162) Super 13-litre (560 Hp, 500 Hp, 460 Hp and 420 Hp)</p> <p><u>Euro V:</u> 7-litre (280 Hp, 250 Hp, 220 Hp) 9-litre (360 Hp, 320 Hp, 280 Hp) 13-litre (450 Hp, 440 Hp, 410 Hp, 380 Hp)</p> <p><u>Euro IV:</u> 9-litre (360 Hp, 320 Hp, 280 Hp) 13-litre (450 Hp, 440 Hp, 410 Hp, 380 Hp)</p> <p><u>Euro III:</u> 9-litre (310 Hp, 250 Hp)</p>	

OEM	Paraffinic Diesel	Model	Engines	Comments
Scania	HVO to EN 15940	P-Series	13-litre (460 Hp, 410 Hp, 360 Hp)	<p>Approved for use in trucks and buses, for Euro III, Euro IV, Euro V, and Euro VI engines. Exception: DC07 101 (which is not approved for mixtures of HVO to EN 15940)</p> <p>Vehicles with a lower chassis serial number than the ones below are <b>not</b> permitted to run on HVO:</p> <ul style="list-style-type: none"> <li>Production site Angers, chassis serial numbers: 9172513 (engines DC09, DC12, DC13) and 9172445 (engine DC16).</li> <li>Production site Södertälje, chassis serial numbers: 2082023 (engines DC09, DC12, DC13) and 2081940 (engine DC16).</li> <li>Production site Zwolle, chassis serial numbers: 5307129 (engines DC09, DC12, DC13) and 5306936 (engine DC16).</li> </ul>
		R-Series	<p><u>Euro VI:</u>  DC16 (123, 122, 121, 120)  Super 13-litre (560 Hp, 500 Hp, 460 Hp, 420 Hp)  DC13 (166, 165, 164, 163)  OC13 101  DC09 (141 – 360 Hp, 140, 139)</p> <p><u>Euro V:</u>  9-litre (360 Hp, 320 Hp, 280 Hp)  13-litre (540 Hp, 500 Hp, 450 Hp, 440 Hp, 410 Hp, 380 Hp)  16-litre (620 Hp, 520 Hp)</p> <p><u>Euro IV:</u>  9-litre (360 Hp, 320 Hp, 280 Hp)  13-litre (500 Hp, 450 Hp, 440 Hp, 410 Hp, 380 Hp)  16-litre (620 Hp, 520 Hp)</p> <p><u>Euro III:</u>  9-litre (310 Hp, 250 Hp)  13-litre (460 Hp, 410 Hp, 360 Hp)  16-litre (560 Hp)</p>	

OEM	Paraffinic Diesel	Model	Engines	Comments
Scania	HVO to EN 15940	S-Series	<p><u>Euro VI:</u>                      DC16 (123, 122, 121, 120)                      Super 13-Litre (560 Hp, 500 Hp, 460 Hp, 420 Hp)                      DC13 (166, 165, 164, 163)                      OC13 101</p>	<p>Approved for use in trucks and buses, for Euro III, Euro IV, Euro V, and Euro VI engines. Exception: DC07 101 (which is not approved for mixtures of HVO to EN 15940)</p> <p>Vehicles with a lower chassis serial number than the ones below are <b>not</b> permitted to run on HVO:</p> <ul style="list-style-type: none"> <li>Production site Angers, chassis serial numbers: 9172513 (engines DC09, DC12, DC13) and 9172445 (engine DC16).</li> <li>Production site Södertälje, chassis serial numbers: 2082023 (engines DC09, DC12, DC13) and 2081940 (engine DC16).</li> <li>Production site Zwolle, chassis serial numbers: 5307129 (engines DC09, DC12, DC13) and 5306936 (engine DC16).</li> </ul>
		Crewcab	<p><u>Euro VI:</u>                      DC13 (165, 164, 163, 162)                      DC09 (141 – 360 Hp, 140, 139)                      DC07 (113, 112, 111)</p>	
		V8	V8 Powertrain (770 Hp, 660 Hp, 590 Hp, 530 Hp)	
		XT	<p><u>Euro VI:</u>                      16-litre (770 Hp, 660 Hp, 650 Hp, 590 Hp, 580 Hp, 530 Hp, 520 Hp)                      13-litre (540 Hp, 500 Hp, 450 Hp, 410 Hp – Torque 2150 Nm, 370 Hp)                      9-litre (360 Hp, 320 Hp, 280 Hp – Torque 1400 Nm)                      7-litre (280 Hp, 250 Hp, 220 Hp)</p>	



OEM	Paraffinic Diesel	Model	Engines	Comments
Volvo	Synthetic diesel (2 <sup>nd</sup> generation biofuel) to EN 15940.	Truck FHI6	D16K (Euro VI)	HVO and GTL is certified for all new Euro VI Volvo engines with no engine issues or service interval changes.
		Truck FH	<u>Euro VI:</u> D13K D13K 420TC D13K 460TC D13K 500TC	
		Truck FM	<u>Euro VI:</u> D11K D13K	
		Truck FMX	<u>Euro VI:</u> D11K D13K	
		Truck FE	D8K (Euro VI)	
		Truck FL	<u>Euro VI:</u> D5K D8K	



# Zemo Partnership

Accelerating Transport to Zero Emissions

## Zemo Partnership

3 Birdcage Walk, London, SW1H 9JJ

T: +44 (0)20 3832 6070

E: [Hello@Zemo.org.uk](mailto:Hello@Zemo.org.uk)

Visit: [Zemo.org.uk](https://www.zemo.org.uk)

 [@Zemo\\_org](https://twitter.com/Zemo_org)

 [Zemo](https://www.linkedin.com/company/zemo)

 [Zemo YouTube Channel](https://www.youtube.com/channel/UC...)