

Frequently Asked Questions

Regulation for In-Use Off-Road Diesel-Fueled Fleets

(Off-Road Regulation)

Repowers Using On-Road Engines FAQ Revised

September 2014

Q – Can off-road vehicles, with off-road engines, be repowered with on-road engine?

A – Yes. Construction companies are starting to consider and undertake projects that utilize on-road engines to replace existing off-road engines. The on-road certified diesel engines used in such projects to date, model year 2007, were manufactured to more stringent emissions standards than 2007 off-road diesel engines.

Repowering scrapers with on-road engines has provided the construction fleets with a cost effective means of lowering their emissions and meeting the upcoming emission performance requirements.

Both on-road diesel engine manufacturers and end users who elect to utilize this compliance alternative should be aware that this alternative may affect the on-road engine's emission control system warranty required by title 13, California Code of Regulations (CCR) section 2035 et seq, as discussed further below.

Q – What are the benefits of repowering off-road vehicles with on-road engines?

A – The differences between on-road and off-road certified engines will vary depending on the year and horsepower. For some model years, an on-road certified engine may emit up to 90 percent less the particulate matter (PM) and 70 percent less nitrogen oxides (NOx) than an off-road engine. Repowering a vehicle with an on-road engine may allow a fleet to meet the emissions targets in the Off-Road Regulation by completing fewer engine repowers or vehicle replacements than would be required if they had used off-road engines.

While this document is intended to assist fleets with their compliance efforts, it does not alter or modify the terms of any CARB regulation, is not a substitute for reading the regulation, nor does it constitute legal advice. It is the sole responsibility of fleets to ensure compliance with the Regulation for In-Use Off-Road Diesel-Fueled Fleets.

Q – Is it cost-effective to repower with an on-road engine?

A – In some cases, yes. For one construction company that used on-road certified engines in their scrapers, repowering with a 2007 on-road certified engine that came with a DPF cost substantially less than the combined cost of repowering with an off-road engine and installing an exhaust retrofit (see figure below). However, this may vary by application. The on-road engine also had substantially lower emissions than the off-road engine, even after a retrofit was installed.



657E scraper with a 2007 Caterpillar C15 On-Road Engine

Q – How do I receive compliance credit towards the Off-Road Regulation for repowering with an on-road engine?

A – To receive credit for the reduced emissions an on-road engine provides compared to an off-road engine, the fleet must report the Executive Order (EO) number for the engine certification. A list of executive orders is available from CARB's on-road certification database at: www.arb.ca.gov/msprog/onroad/cert/cert.php

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An example of the emissions information in an on-road engine EO is shown below, with the applicable data shown in bold. A fleet repowering with this engine would be able to use an emission factor of 0.2 g/bhp-hr for this engine:

	NMHC		NO _x		NMHC+NO _x		CO		PM		HCHO	
	FTP	EURO	FTP	EURO	FTP	EURO	FTP	EURO	FTP	EURO	FTP	EURO
STD	0.02	0.14	0.2	.25	-	-	15.5	15.5	0.01	0.01	-	-
FEL	-	-	-	-	-	-	-	-	-	-	-	-
CERT	0.02	0.03	.15	0.15	-	-	1.7	0.1	0.01	0.01	-	-

Q – How will repowering with an on-road engine affect the warranty of my engine?

A – All fleets and installers who choose to pursue this compliance option should be aware of the possible implications to the engine’s emissions control system warranty, as outlined in Title 13, CCR. Specifically, 13 CCR 2036(j)(1) states that “[t]he repair or replacement of any warranted part otherwise eligible for warranty coverage under subsection (d) or (i), shall be excluded for such warranty coverage if the vehicle or engine manufacturer demonstrates that the vehicle or engine has been abused, neglected, or improperly maintained, and that such abuse, neglect, or improper maintenance was the direct cause of the need for the repair or replacement of the part.”

Therefore, if an engine manufacturer demonstrates that installing an on-road engine into an off-road application constitutes “abuse, neglect, or improper maintenance” that directly causes damage to a warranted part, it could refuse to repair or replace any warranted part on the on-road engine.

Q – Are there safety concerns to be aware of when repowering with an on-road engine?

A – Vehicle owners should be aware of several important safety issues before pursuing this option, and the vehicle owner should ensure they are working with experienced mechanics who understand both the on-road engine requirements and the use of the vehicle in question. Possible issues include making sure that the off-road application provides sufficient cooling for the on-road engine, and that the structure of the vehicle is not impaired by the modification necessary to install the on-road engine.

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