

Ensure that anyone servicing your engine can read and understand the diagnostic trouble codes stored in the on-board computer with generic tools and information.

(f) *Consider exceptions for certain conditions.* Your diagnostic systems may disregard trouble codes for the first three minutes after engine starting. You may ask us to approve diagnostic-system designs that disregard trouble codes under other conditions that would produce an unreliable reading, damage systems or components, or cause other safety risks. This might include operation at altitudes over 8,000 feet.

(g) *Follow standard references for formats, codes, and connections.* Follow conventions defined in the following documents (incorporated by reference in § 1048.810) or ask us to approve using updated versions of (or variations from) these documents:

(1) ISO 9141-2 Road vehicles-Diagnostic systems—Part 2: CARB requirements for interchange of digital information, February 1994.

(2) ISO 14230-4 Road vehicles—Diagnostic systems—Keyword Protocol 2000—Part 4: Requirements for emission-related systems, June 2000.

§ 1048.115 What other requirements must my engines meet?

Your engines must meet the following requirements:

(a) *Closed crankcase.* Your engines may not vent crankcase emissions into the atmosphere throughout their useful life, with the following exception: your engines may vent crankcase emissions if you measure and include these crankcase emissions with all measured exhaust emissions.

(b) *Torque broadcasting.* Electronically controlled engines must broadcast their speed and output shaft torque (in newton-meters) on their controller area networks. Engines may alternatively broadcast a surrogate value for torque that can be read with a remote device. This information is necessary for testing engines in the field (see 40 CFR 1065.515). This requirement applies beginning in the 2007 model year. Small-volume engine manufacturers may omit this requirement.

(c) *EPA access to broadcast information.* If we request it, you must provide us any hardware or tools we would need to readily read, interpret, and record all information broadcast by an engine's on-board computers and electronic control modules. If you broadcast a surrogate parameter for torque values, you must provide us what we need to convert these into torque units. We will not ask for hardware or tools if they are readily available commercially.

(d) *Emission sampling capability.* Produce all your engines to allow sampling of exhaust emissions in the field without damaging the engine or equipment. Show in your application for certification how this can be done in a way that prevents diluting the exhaust sample with ambient air. To do this, you might simply allow for extending the exhaust pipe by 20 cm; you might also install exhaust ports downstream of any aftertreatment devices.

(e) *Adjustable parameters.* Engines that have adjustable parameters must meet all the requirements of this part for any adjustment in the physically adjustable range.

(1) We do not consider an operating parameter adjustable if you permanently seal it or if ordinary tools cannot readily access it.

(2) We may require that you set adjustable parameters to any specification within the adjustable range during certification testing, production-line testing, selective enforcement auditing, or any in-use testing.

(f) *Prohibited controls.* You may not design your engines with emission-control devices, systems, or elements of design that cause or contribute to an unreasonable risk to public health, welfare, or safety while operating. For example, this would apply if the engine emits a noxious or toxic substance it would otherwise not emit that contributes to such an unreasonable risk.

(g) *Defeat devices.* You may not equip your engines with a defeat device. A defeat device is an auxiliary emission-control device that reduces the effectiveness of emission controls under conditions you may reasonably expect the engine to encounter during normal operation and use. This does not apply to auxiliary emission-control devices

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you identify in your certification application if any of the following is true:

(1) The conditions of concern were substantially included in your prescribed duty cycles.

(2) You show your design is necessary to prevent catastrophic engine (or equipment) damage or accidents.

(3) The reduced effectiveness applies only to starting the engine.

§ 1048.120 What warranty requirements apply to me?

(a) *General requirements.* You must warrant to the ultimate buyer that the new nonroad engine meets two conditions:

(1) It is designed, built, and equipped it to conform at the time of sale with the requirements of this part.

(2) It is free from defects in materials and workmanship that may keep it from meeting these requirements.

(b) *Warranty period.* Your emission-related warranty must be valid for at least 50 percent of the engine's useful life in hours of operation or at least three years, whichever comes first. In the case of a high-cost warranted part, the warranty must be valid for at least 70 percent of the engine's useful life in hours of operation or at least five years, whichever comes first. You may offer an emission-related warranty more generous than we require. This warranty may not be shorter than any published or negotiated warranty you offer for the engine or any of its components. If an engine has no hour meter, we base the warranty periods in this paragraph (b) only on the engine's age (in years).

(c) *Components covered.* The emission-related warranty must cover components whose failure would increase an engine's emissions, including electronic controls, fuel injection (for liquid or gaseous fuels), exhaust-gas recirculation, aftertreatment, or any other system you develop to control emissions. We generally consider replacing or repairing other components to be the owner's responsibility.

(d) *Scheduled maintenance.* You may schedule emission-related maintenance for a component named in paragraph (c) of this section, subject to the restrictions of § 1048.125. You are not required to cover this scheduled maintenance

under your warranty if the component meets either of the following criteria:

(1) The component was in general use on similar engines, and was subject to scheduled maintenance, before January 1, 2000.

(2) Failure of the component would clearly degrade the engine's performance enough that the operator would need to repair or replace it.

(e) *Limited applicability.* You may deny warranty claims under this section if the operator caused the problem, as described in 40 CFR 1068.115.

(f) *Aftermarket parts.* As noted 40 CFR 1068.101, it is a violation of the Act to manufacture an engine part if one of its main effects is to reduce the effectiveness of the engine's emission controls. If you make an aftermarket part, you may—but do not have to—certify that using the part will still allow engines to meet emission standards, as described in 40 CFR 85.2114.

§ 1048.125 What maintenance instructions must I give to buyers?

Give the ultimate buyer of each new nonroad engine written instructions for properly maintaining and using the engine, including the emission-control system. The maintenance instructions also apply to service accumulation on your test engines, as described in 40 CFR part 1065, subpart E.

(a) *Critical emission-related maintenance.* Critical emission-related maintenance includes any adjustment, cleaning, repair, or replacement of air-induction, fuel-system, or ignition components, aftertreatment devices, exhaust gas recirculation systems, crankcase ventilation valves, sensors, or electronic control units. This may also include any other component whose only purpose is to reduce emissions or whose failure will increase emissions without significantly degrading engine performance. You may schedule critical emission-related maintenance on these components if you meet the following conditions:

(1) You may ask us to approve critical emission-related maintenance only if it meets two criteria:

(i) Operators are reasonably likely to do the maintenance you call for.