



April 12, 2023

Chairmans Marcotte and Nicoll; Vice Chair Jerome and members of the Vermont House Committee on Commerce and Economic Development:

Thank you for the opportunity to present our views on this matter. I am here today as Executive Director of the Diesel Technology Forum. In our 23rd year, we are a national, not-for profit educational organization based in the Maryland suburbs of Washington, DC. We represent manufacturers of diesel engines and equipment, components, petroleum, and renewable biofuel producers. Through original research, education, and fact-based outreach, we seek to expand the broader understanding about the benefits and advancements in diesel engines, technologies, and fuels as well as their significance to our economy and how they help achieve clean air and climate goals. You can learn more about us on our website www.dieselforum.org.

Regarding VT H-0081, the Agricultural Equipment Fair Repair Act, I would like to express our **opposition to Vermont House Bill 81** because it takes Vermont the wrong way for clean air and the wrong way on safety. It has the real potential to jeopardize Vermont's record of clean air by facilitating emissions controls tampering, a practice that is in clear violation of the Federal Clean Air Act.

I. Introduction

Diesel engines power nearly all farm tractors and machines thanks to their unique combination of efficiency, power, durability, and reliability. Over the last two decades, manufacturers of diesel engines and equipment have invested billions of dollars to reduce emissions to near zero levels and meet federal clean air requirements, as you can see in the attached chart. Across the country, all of us – including all Vermonters – benefit from these advanced technological innovations in the form of cleaner air.

Based on enforcement actions taken by the US Environmental Protection Agency (US EPA) and other information, tampering with emissions controls is already a major concern. So called "Right to Repair" legislation, as proposed, essentially enables this practice by opening the door to access engine computers and software that ensure control of emissions to and prevent harm to both people and the environment. Even if a repair were to be performed in good faith and not with the intent to override the emissions controls system, the consequences are the same.

Why would someone knowingly modify or tamper with emissions controls? The act of tampering is linked most often to the desire to save time, money or improve performance. Improving performance has different meanings for everyone. For some, improving performance would mean accessing the engine computer to adjust or disable engine speed limiters to enable tractors to travel at faster ground speeds, perhaps beyond the safe design of steering and braking systems. For some, getting "more power" would require tweaking the system to get higher fuel injection rates or pressures or adjustments in engine timing. The motivation to save money can result in anything from the physical removal of particulate filters or catalysts to overtly overriding emissions computer control systems, thereby avoiding the need to fill up with diesel exhaust fluid – a critical component for assuring emissions compliance. Even those seeking to legitimately repair a machine or equipment could inadvertently alter engine and emissions control systems. The results are all the same, emissions control systems that ensure clean air compliance are violated and emissions increase, and there are likely safety concerns as well.

II. Original Equipment Manufacturers (“OEMs”) Are Subject To A Wide Range Of Federal Requirements In The Clean Air Act (CAA) That Govern The Building And Warranting Their Products For Emissions Performance

Section 202(m) of the Clean Air Act (42 U.S.C. §7521) provides authority for EPA to adopt regulations requiring on-board diagnostics and provision of related service and repair information. EPA adopted such rules in 1993 and 1994 for light-duty passenger cars and trucks, and 2009 for heavy-duty on-highway vehicles and engines.

While Section 202(m) specifically references on-highway applications such as light duty (motor) vehicles, light duty trucks, and heavy duty (motor) vehicles and engines, it presumably does not limit EPA’s authority to adopt similar regulations for off-road applications. Thus far, EPA has not taken action to adopt similar on-board diagnostics and service information rules for off-road vehicles and engines. Therefore, any reference to statutory requirements that an off-road equipment manufacturer provide customers the same level of diagnostic access as they provide to authorized dealers, does not apply to off-road OEMs.

The open access and the information that H.B. 81 would require may conflict with federal manufacturer obligations to help ensure that equipment and engine emissions systems remain compliant to Tier 4 standards during their entire useful life. See 40 CFR 1039.240, 1039.245; see also 1039.101(g) (useful life requirements); 42 USC § 7525(a)(1) reference to testing to determine conformance to regulations prescribed under § 7521; § 7521(a)(1) requires regulations to prescribe a “useful life” over which vehicles/engines shall comply with emission standards.

- **Durability Regulations/Testing:** 40 CFR 1039.240, 1039.245; see also 1039.101(g) (useful life requirements); see 42 USC § 7525(a)(1) reference to testing to determine conformance to regulations prescribed under § 7521; § 7521(a)(1) requires regulations to prescribe a “useful life” over which vehicles/engines shall comply with emission standards.
- **Degradation Factor/In-Use Testing:** 40 CFR 1039.240, 1039.245, 1039.401; 42 USC § 7541(c)(6)
- **Tamper Resistant Emissions Systems**
 - 40 CFR Part 1039 -- Control of Emissions from New and In-Use Nonroad Compression-Ignition Engines for Part 1039 regs.
 - 42 U.S.C. 7522 (a)(3)
 - 42 U.S.C. 7522 (a)(4)
 - 42 U.S.C. § 7413(c)(2)(C). It is a crime to knowingly falsify, tamper with, render inaccurate, or fail to install any “monitoring device or method” required under the CAA. Per EPA, “Vehicle Onboard Diagnostics (OBD) are a ‘monitoring device or method’ required by the CAA.”

In summary, manufacturers have Clean Air Act obligations to help ensure the integrity of Tier 4 emissions systems. The U.S. Clean Air Act, and regulations promulgated thereunder, requires equipment manufacturers to build-in base level tampering safeguards. Restricting access to the software that defines a machine’s emissions performance is part of these base-level tampering safeguards.

If H.B. 81 is passed, manufacturers could be held liable for providing a “defeat device” to the market in the form of a service tool that allows end-users to circumvent certain engine/machine performance inhibitors related to emission controls. This is especially true for selective catalytic reduction (“SCR”) - equipped engines that rely on routine end-user action (e.g., filling the diesel exhaust fluid (“DEF”) tank)

to ensure proper operation of the SCR system. If the end-user doesn't take that action, the regulations require engine manufacturers to inhibit operation of the engine. The bottom line is that if manufacturers provide customers the tool for overriding those inhibitors in the way that H.B. 81 would require, that could be considered by the U.S. EPA as circumventing the regulatory requirements.

It is important to note that under these regulations, OEMs could be held liable for providing a "defeat device" to the market in the form of a service tool that allows end-users to circumvent certain engine/machine performance inhibitors related to emission controls. If OEMs provide customers with the tool for overriding those inhibitors, that's considered circumventing the regulatory requirements. This may not be an obvious take-away after reading the referenced regulations and statutes. The California Air Resources Board (CARB) and the US Environmental Protection Agency (US EPA), however, have gone through a lengthy process of interpreting those references and providing guidance to the industry that delivers this outcome.

III. The Incidence of Tampering with Emissions Controls in Vermont Is Well Documented.

The US EPA Air Enforcement Division ("USEPA AED") released a substantial [report](#) in November 2020 (regarding the incidence of tampering with diesel engines and emissions controls. Tampering can include removal of devices such as particulate filters or catalytic converters, bypassing of such devices, rendering devices and their control systems inoperable through various means.

EPA enforcement actions, identified that a substantial portion of the subject vehicles had software modifications to their engine emissions control units. Excerpts of Table 5 from the aforementioned report are included below. They show that in Vermont, EPA Enforcement office estimates that through 2019, in Vermont there were over 1,700 vehicles (pick-up trucks) that had been tampered with, representing as much as 19 percent of the entire heavy-duty diesel pick-up fleet in the state -- where a defeat device or other measure deleted some emissions controls.

Table 5. Observed Class 2b and 3 Tampering from 2009 through 2019 by State

State	Estimated Deleted Vehicles	Estimated Registered Diesel Vehicles (2016)	Estimated Deleted Vehicles, % of Total 2016 Fleet	Estimated Registered Diesel Vehicles (2016), 2003+ MY Only	Estimated Deleted Vehicles, % of Total 2016 Fleet, 2003+ MY Only	Estimated Excess NO _x from Class 2b and 3 Vehicles Deleted (tons)	Estimated Excess PM from Class 2b and 3 Vehicles Deleted (tons)
NORTH DAKOTA	7,901	42,389	18.6%	30,907	25.6%	8,085	77
IDAHO	13,474	89,880	15.0%	55,183	24.4%	13,787	131
WYOMING	8,619	60,803	14.2%	43,159	20.0%	8,819	84
MAINE	2,794	20,738	13.5%	13,511	20.7%	2,859	27
VERMONT	1,718	12,768	13.5%	8,988	19.1%	1,758	17
MICHIGAN	18,382	140,885	13.0%	87,406	21.0%	18,809	178

Nationwide, US EPA automotive enforcement division estimates that the emissions controls were removed from more than 550,000 diesel pickup trucks nationwide in the last decade (2010-2020). As a result of this tampering, more than 570,000 tons of excess oxides of nitrogen (NOx) and 5,000 tons of particulate matter (PM) will be emitted by these tampered trucks over the vehicles' lifetimes. From EPA's report comes the following:

“The EPA has [found](#) numerous companies and individuals that have manufactured and sold both hardware and software specifically designed to defeat required emissions controls on vehicles and engines used on public roads as well as on nonroad vehicles and engines. Illegally-modified vehicles and engines contribute substantial excess pollution that harms public health and impedes efforts by the EPA, tribes, states, and local agencies to plan for and attain air quality standards.”

While the USEPA AED report did not directly quantify the extent of tampering in off road engines and equipment, it notes that **“...AED has reason to believe this conduct occurs within most or all categories of vehicles and engines , including commercial trucks, passenger vehicles , pickup trucks, motorcycles , forestry equipment, and agricultural equipment.”**

IV. Vermont has a record of Clean Air; Right to Repair Legislation will Contribute to Degraded Air Quality

The most recent 2022 “State of the Air” report, by the American Lung Association, found that Vermont remains one of the cleanest areas for air quality, with some of the lowest levels of particle air pollution and ozone. The Burlington-South Burlington metro area was one of only 10 cities in the nation to rank as a cleanest city for all three measured pollutants.

As evidenced from the USEPA AED report noted previously, tampering with emissions controls is directly linked to higher emissions. Right to Repair legislation if enacted would likely contribute to the degradation of air quality in Vermont through higher emissions of particulate matter and nitrogen oxide emissions, a precursor to ozone formation.

V. Diesel Powered Farm Equipment Utilizes Advanced Emissions Control Systems

Achieving near-zero emissions from diesel engines is accomplished by a highly integrated system of computers and controllers that control the combustion process and treat the exhaust emissions on a real-time basis. This involves using sophisticated systems like selective catalytic reduction (SCR) and diesel particulate filters.

Since 2014, many farm tractors and machines utilize advanced SCR systems. These are [active emissions scrubbers](#) on the machine – one where in a specialized catalyst, exhaust gases are treated by carefully calibrated sprays of Diesel Exhaust Fluid (“DEF”; aqueous urea) resulting in a chemical reaction that virtually eliminates nitrogen oxide emissions. Because it is an active system, DEF fluid must be refilled periodically based on fuel consumption, and that costs money. Today’s DEF costs about \$30-\$40 dollars for a 2.5-gallon jug. Row crop tractors can typically hold 4-6 gallons.

Unfortunately, some creative individuals and repair shops have illegally accessed the engine computer and software and reprogramming to “trick” the engine into thinking that the SCR systems are dosing and operating properly, and diesel exhaust fluid levels are full, when in fact they are not operating at all or at very diminished levels, which is advertised as saving the operator the cost of refilling DEF fluid and avoiding expensive maintenance on particulate filters. SCR-equipped engines that rely on routine end-user action (e.g., filling the DEF tank) to ensure proper operation of the SCR system. If the end-user doesn’t take that action, the regulations require engine manufacturers to inhibit operation of the engine, going into a limp mode and then shutting it down until repaired.

Sometimes called chipping, tuning, or ECU remapping, this service is offered to farmers by a variety of individuals and companies. Right to Repair legislation will further facilitate this practice by providing open access to engine emissions control software, which is why we are opposed. Making changes to

engine control units (ECU's) – computers and their controllers– to enhance the performance or evade emission controls has become a significant issue across North America. Being sold as “boosting performance” for pennies on the dollar compared to the cost of buying higher-capacity equipment and saving money through bypassing maintenance on emissions control systems; this practice must look like an attractive proposition, but it's not. It may void the equipment's warranty insurance agreements and is illegal in the U.S.

What VT H-81 legislation would do, if enacted, would be to enable the defeat of these systems, denigrate emissions performance and make agricultural, forestry and other equipment dirtier not cleaner, and increase emissions, not reduce them. Ultimately, a yes vote on HB0081 is a vote **against** the health and safety of your constituents and the environment itself.

VI. Summary

Modern diesel engines in farm and agricultural equipment are more efficient, powerful, and productive than ever before, while also meeting the most stringent clean air emissions requirements that virtually eliminate emissions of nitrogen oxides and particulate matter. Unfortunately, as EPA's own enforcement actions document, the incidence of tampering with these emissions controls is significant and the consequences for the environment are not good.

At the Diesel Technology Forum, we are working to do our part to encourage better stewardship of diesel technology by users, such as through the support of state legislation to tighten fines and penalties against the practice of “rolling coal” by pickup trucks. And just a few weeks ago, we launched a national campaign to discourage tampering and promote clean operation of diesel engines and equipment of all kinds.

Fair Repair legislation like this takes us the wrong way on environmental progress by facilitating access to software that directly controls engines and emissions control systems, effectively saying it is okay for anyone to mess around with the computer controls and software on a tractor even if it might result in unintended consequences of higher emissions or unsafe operation. That is not what we want.

For all these reasons and others, VT, H-0081 so-called Fair Repair Act should not be enacted because takes Vermont the wrong way for clean air and the wrong way on safety.

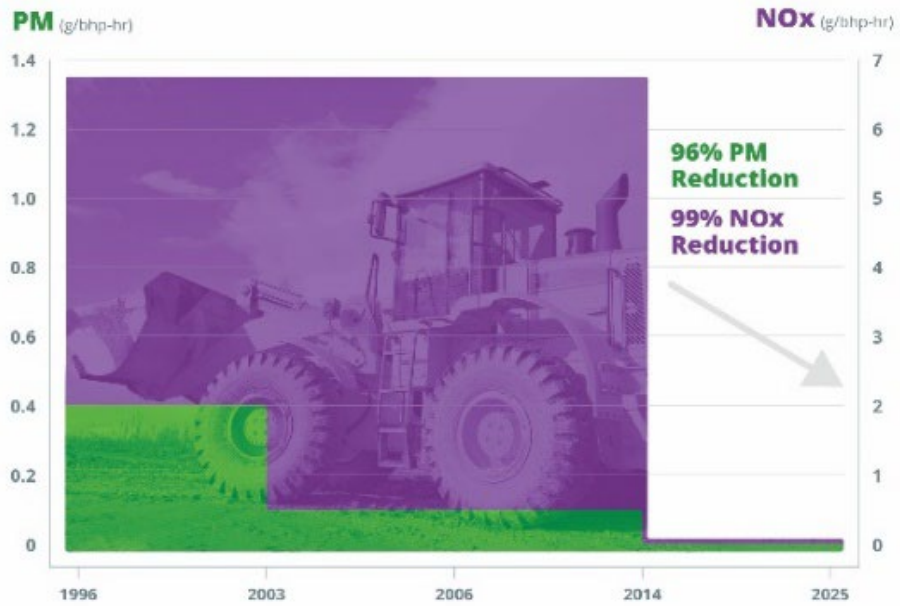
Thank you for considering these comments. We welcome the opportunity to answer questions and work further with the Committee.

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CLEAN DIESEL PROGRESS

Large Off-Road Equipment



Source: U.S. EPA Office of Transportation and Air Quality (OTAQ)