Regulatory Update

Fact Sheet
Diesel Exhaust Fluid (DEF) Guidance

- EPA is issuing guidance urging engine and equipment manufacturers to revise their DEF system software in existing vehicles and equipment to reduce derates.
- Selective Catalytic Reduction (SCR) is an emissions control technology used in diesel engines to reduce nitrogen oxide (NOx) emissions through the use of diesel exhaust fluid (DF).
- Since 2010, SCR, which was developed by the heavy-duty truck manufacturers as an alternative compliance method, has been used in nearly all on-road diesel vehicles and many nonroad machines (e.g., tractors, construction equipment) to meet EPA's 2010 on-highway NOx standards and Tier 4 standards for nonroad engines.
- SCR systems use on-board diagnostics sensors to detect when DEF runs out; if detected, the engine control module initiates an automatic derate.
    - An automatic derate rapidly decreases the vehicle's performance; within four hours, the vehicle speed is reduced to five miles per hour.
    - This decrease in performance is intended to ensure compliance with EPA's 2010 on-highway NOx standards and Tier 4 standards for nonroad engines.
- However, these sensors can fail, triggering an automatic derate.
    - Derates can be catastrophic, limiting vehicle speed to as little as five miles per hour within hours, causing significant disruptions in logistics, agriculture, and construction.
    - In 2021, a sensor error led to widespread failures across all vehicle and engine brands, leading to an industry-wide recall.
- Automatic derates have raised safety concerns, operational delays, and real economic hardship for countless truckers, farmers, and other equipment users.
- Starting with model year (MY) 2027, all new on-road diesel vehicles must be engineered to avoid sudden power and speed loss after DEF depletion. However, the problem remains for vehicles until the MY2027 rule takes effect.
- EPA is responding to concerns from American farmers, truckers, and equipment operators to alleviate hardships caused by derates.
- The guidance uses a three-phased decreasing, stepwise approach (initial, secondary, final) for four classes of vehicles: motor coaches, heavy-duty (HD) trucks, HD pickups and light-duty (LD) cars, and nonroad equipment (typically farming) (see next page).

EPA United States Environmental Protection Agency

Office of Air and Radiation
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- Nonroad equipment will now have no performance impact for 36 hours, saving farmers hundreds of hours and millions of dollars.

MOTOR COACHES

Category	Initial		Secondary		Final		Before	
	Timing	Level	Timing	Level	Timing	Level	Timing	Level
Motor Coaches	3,000 miles / 40 hours	10% Torque Reduction	n/a		10,500 miles / 200 hours	50 mph	4 hours	5 mph

HD TRUCKS

Category	Initial		Secondary		Final		Before	
	Timing	Level	Timing	Level	Timing	Level	Timing	Level
HD Trucks	650 miles / 10 hours	15% Torque Reduction	4,200 miles / 80 hours	30% Torque Reduction	8,400 miles / 160 hours	25 mph	4 hours	5 mph

HD PICKUPS AND LD CARS

Category	Initial		Secondary		Final		Before	
	Timing	Level	Timing	Level	Timing	Level	Timing	Level
HD Pickups and Light Duty Cars	n/a	n/a	n/a	n/a	4,200 miles / 80 hours	45 mph	4 hours	5 mph

NONROAD

Category	Initial		Secondary		Final		Before	
	Timing	Level	Timing	Level	Timing	Level	Timing	Level
Nonroad Equipment	36 hours	25% Torque Reduction*	n/a	n/a	100 hours	50% Torque Reduction**	4 hours	Idle Only

*Nonroad constant speed engines (e.g., agricultural pumps) and gensets do not have an initial inducement step as any torque reduction may limit product functionality.
**Nonroad equipment can be restarted with full power 3 times for up to 30 minutes after inducement.