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Non-Road Diesel Engines

Technologies for Reducing Fuel Consumption & Emissions.



Topics

- ❖ Engine Repower/EUG and the recent EPA change.
- ❖ Anti Idle Fuel Savings.
- ❖ Engine Technology Fuel Savings.
- ❖ Exhaust Aftertreatment.
- ❖ New/Emerging Technologies.
- ❖ Utilization of on-site firms that monitor requirements.



CFR Title 40 S1068.240

- ❖ Replacement of engines that fail prematurely if ***none*** of the following is true:
- ❖ Core engine can be repaired or rebuilt.
- ❖ A used or rebuilt/remanufactured engine is not available.
- ❖ A new current tier engine cannot be installed.



- ❖ Emission Upgrades/EUGs are not affected by CFR Title 40, S 1068.240



Anti-Idle

- ❖ Certain manufacturers like Caterpillar are offering software controls that provide idle limitation.
- ❖ Manufacturers like Flight Systems offer retrofit devices.



Idle Reduction

Flight Systems



How it Works

A countdown sequence is initiated when the parking brake (or other switch that is ground when engaged) is set **OR** command signal is received from "Park" position (switch closure to +). If the signal is removed before the time period expires the unit is reset and the engine is not shut down. The unit is connected to the Run, Fuel Pump, or Coil circuit on the engine or the ECM Stop input.

Available as 3 minute, 5 minute or 10 minute.



Engine Technology Fuel Savings

- ❖ Electronics Control.
- ❖ Fuel Injection Technology.
- ❖ Turbocharger Technology.
- ❖ Combustion Technology.



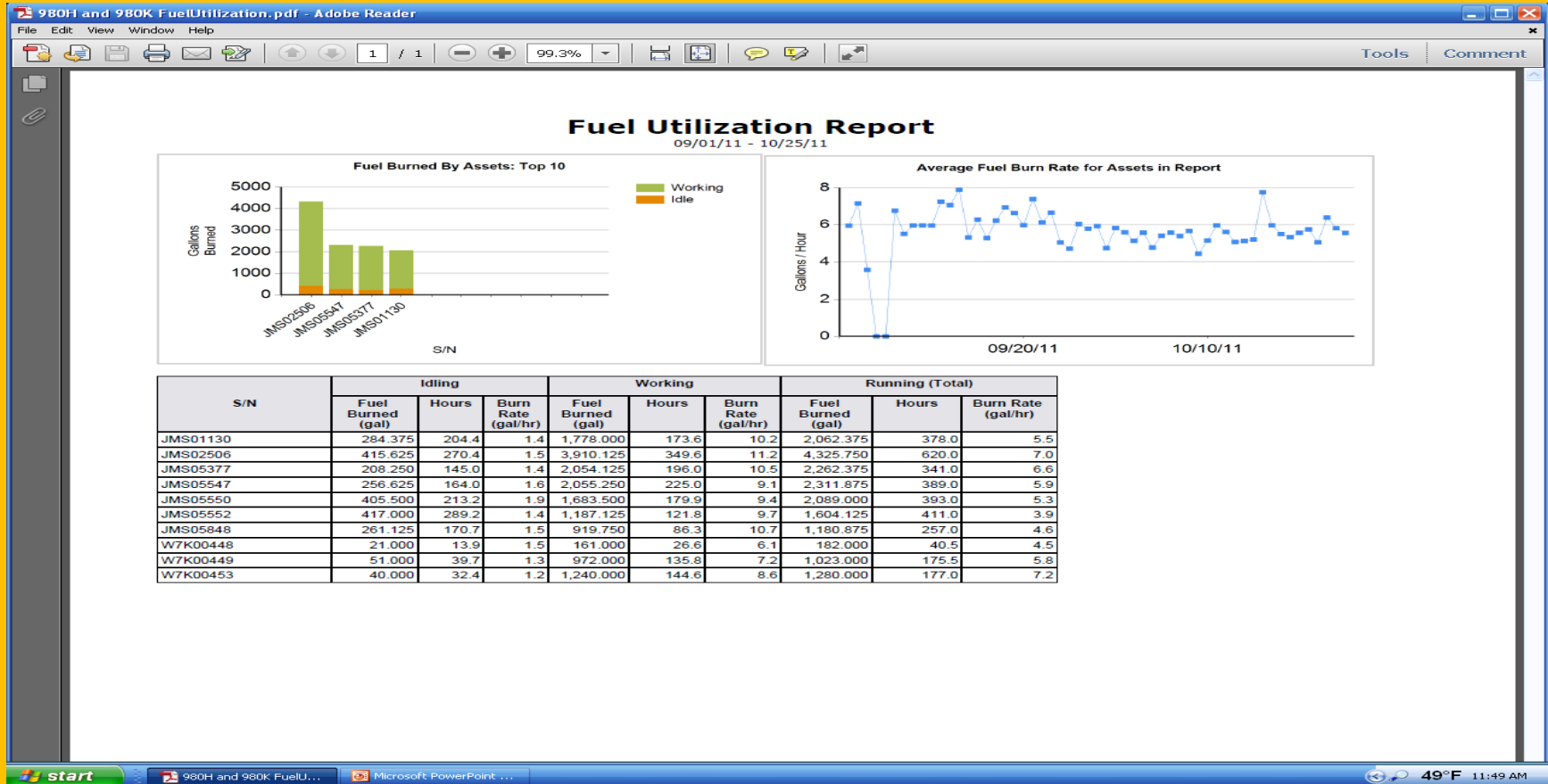
Tier fuel use changes

- ❖ Tier 0 to Tier 1 plus 5%.
- ❖ Tier 1 to Tier 2 plus 5%.
- ❖ Tier 2 to Tier 3 minus 5% to 8%.
- ❖ Tier 3 to Tier 4 plus 5% to 6%.

Current technology places us back to Tier 2 levels.

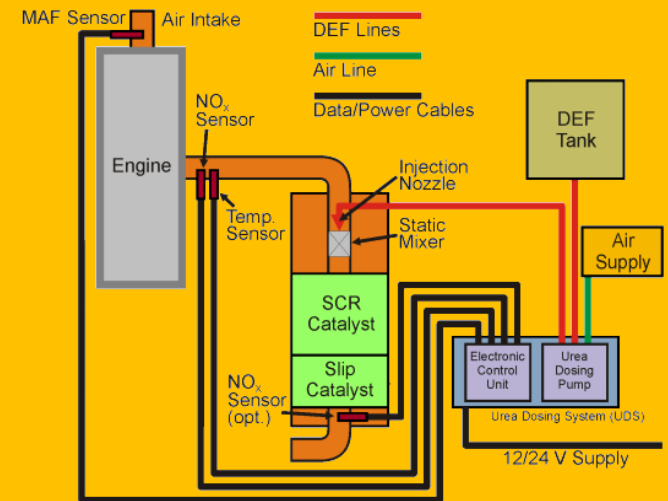
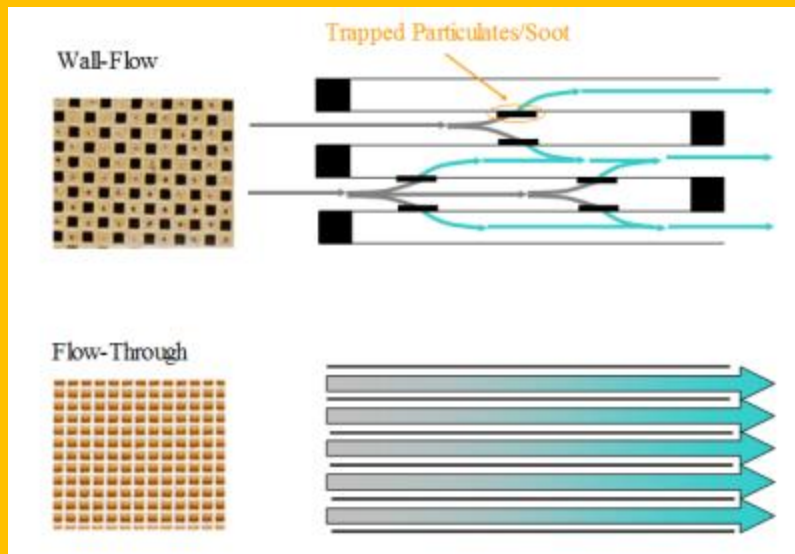


Actual Comparison of a Caterpillar, Model 980, Loader Tier 3 to Tier 4.



Exhaust Aftertreatment

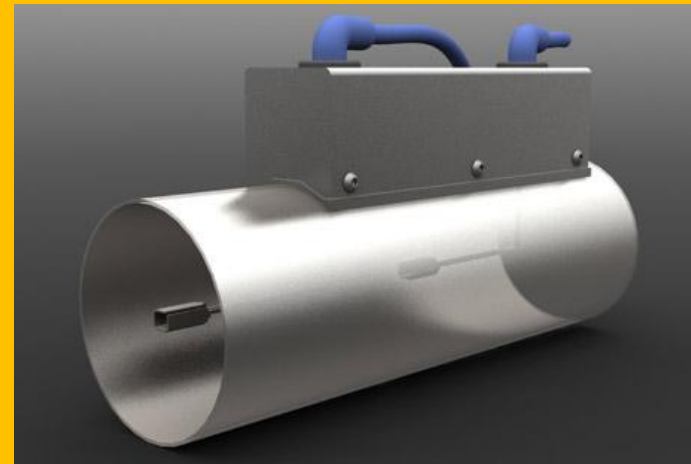
- ❖ Diesel Oxidation Catalyst.
- ❖ Diesel Particulate Filters.
- ❖ Selective Catalytic Reduction



New/Emerging Technologies

- ❖ PlasmaClean/Environmental Energy Technologies, Inc.
- ❖ PlasmaClean chamber with two emitters
- ❖ **Emitters** create corona and produce non-thermal plasma. Oxidation process occurs.
- ❖ **Power Module** delivers 30,000 volts / 300 watts into PlasmaClean reactor chamber to eliminate emissions and particulate matter.

The PlasmaClean system has been in development for about four years with support from the New York State Energy Research and Development Authority (NYSERDA). The technology originated at Rochester Institute of Technology (RIT) and was licensed to EET for commercialization. EET has since applied for two additional patents.



New/Emerging Technologies

- ❖ Selective Catalytic Reduction utilizing a solid instead of liquid urea to produce ammonia for catalytic reaction.
- ❖ Amminex, Tenneco/GE
- ❖ PurePower Technologies



On-Site Monitor Firms

- ❖ Utilization of a contracted/third party on site monitor firm to make certain that job requirements related to air quality are fulfilled.
- ❖ Guidepost Solutions LLC. (formerly SafirRosetti)
- ❖ Martin P. Lanahan, Inc.



Questions??

