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Volvo Trucks' EPA'10 Testing Experience

- About 30 EPA'10 test trucks now in customer fleets
 - 1.7 million miles accumulated to date
- 23 SCR evaluation trucks (non-EPA'10) since 2002
 - more than 9 million miles
- Volvo Trucks has more than 150,000 SCR-equipped Euro IV and Euro V trucks globally
 - **Over 2 billion miles**



2010 – SCR DRIVER IMPACTS AND ISSUES

- What does the driver need to do differently when driving an SCR-equipped truck?
- What happens if he fails to re-fill the DEF (Diesel Exhaust Fluid) tank?
- What happens if the DEF tank is filled with poor quality fluid?
- What happens if the SCR system is tampered with?

Note: This presentation is a generic representation of the issue and is not specific to any brand of engine or vehicle including Volvo.



2010 - What does the SCR driver need to do?

- The driver needs to add DEF to the DEF tank periodically. A typical tank size will be around 20 gallons, which should yield a DEF range of at least twice the range of a full fuel system.
- The DEF tank will have a blue cap and a small throat (19.2 mm) that will prohibit insertion of a diesel fuel nozzle.

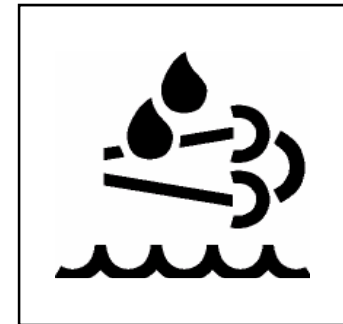


2010 - What does the SCR driver need to do?

- There will be an additional gauge or indicator on the instrument panel to monitor the level of the DEF.



The driver must also monitor the DEF system status indicator lamp and MIL lamp.



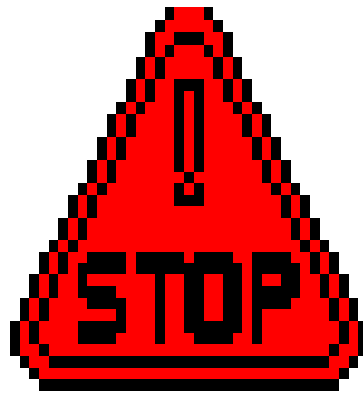
2010 -- What if the driver fails to re-fill?

- There is a red zone or low level warning indicator on the DEF gage. The driver should refill with DEF before it gets into the red.
- If the DEF level goes below ~1/8 tank, the DEF system status lamp illuminates (solid). An instructional decal affixed to the sunvisor will provide the driver a summary of what is to come. The driver should re-fill with DEF.
- If the driver continues driving without refilling, after several hundred miles or more, the DEF level gage will read empty. At this point the DEF system status lamp will begin to flash once per second. To reinforce to the driver that the system is critical, he is penalized by the engine depowering significantly (first stage inducement).



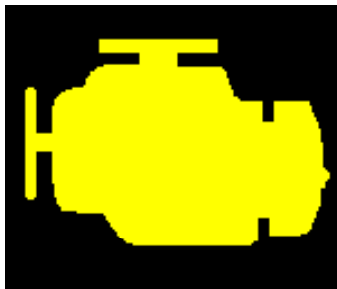
2010 -- What if the driver fails to re-fill?

- If he continues to drive with de-powered engine, and the tank becomes empty and the DEF pump loses pressure, second stage inducement will be activated.
- The stop engine lamp will illuminate. After then turning the key off and back on, a 5 mph road speed limit will be activated. A service tool will be required to re-set.



2010 - What happens if the driver refills with improper DEF or tampers with the SCR system?

- If incorrect fluid is detected in the DEF tank (such as water or coolant) or if tampering with the system (producing high NOx) is detected, the Check Engine light will illuminate. The driver should seek assistance.
- After 10 hours driving with the check engine light illuminated, first stage inducement (power de-rate) will occur.
- If the vehicle is driven another 10 hours with the check engine light on, second stage inducement is enabled. The MIL (malfunction indicator lamp) is illuminated. When the engine is keyed off and back on, maximum vehicle speed is limited to 5 miles per hour. A service tool is required to re-set.



(Note: Not yet “set in stone” and may vary slightly by engine manufacturer)