

EC-490 Diesel Aftertreatment System

SCR

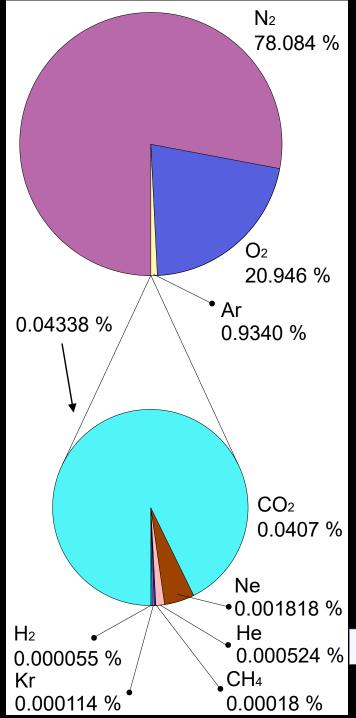
DEF - A little chemistry

**DPF** 



# Taking the Mystery Out of SCR

2 
$$(NH_2)_2CO + 4 NO + O_2 \rightarrow 4 N_2 + 4 H_2O + 2 CO_2$$
 and  
 $4 (NH_2)_2CO + 6 NO_2 \rightarrow 7 N_2 + 8 H_2O + 4 CO_2$ 



https://commons.wikimedia.org/wiki/File:Atmosphere\_gas\_proportions.svg |, the copyright holder of this work, release this work into the public domain. This applies worldwide. Accessed 19 May 2020

### Refer to this link -

### 2017 MY OBD SYSTEM OPERATION SUMMARY FOR DIESEL ENGINES

Or do a Google search for this file DOBDSM1701.pdf



#### Ford Document



## System Architecture

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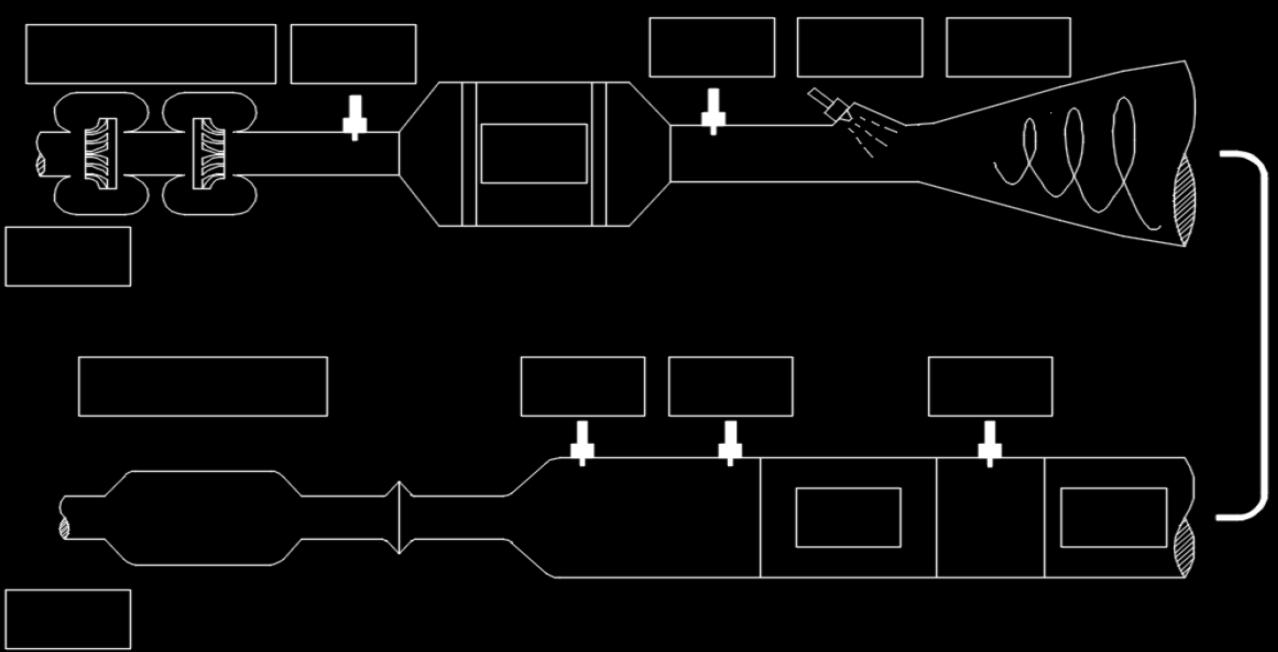




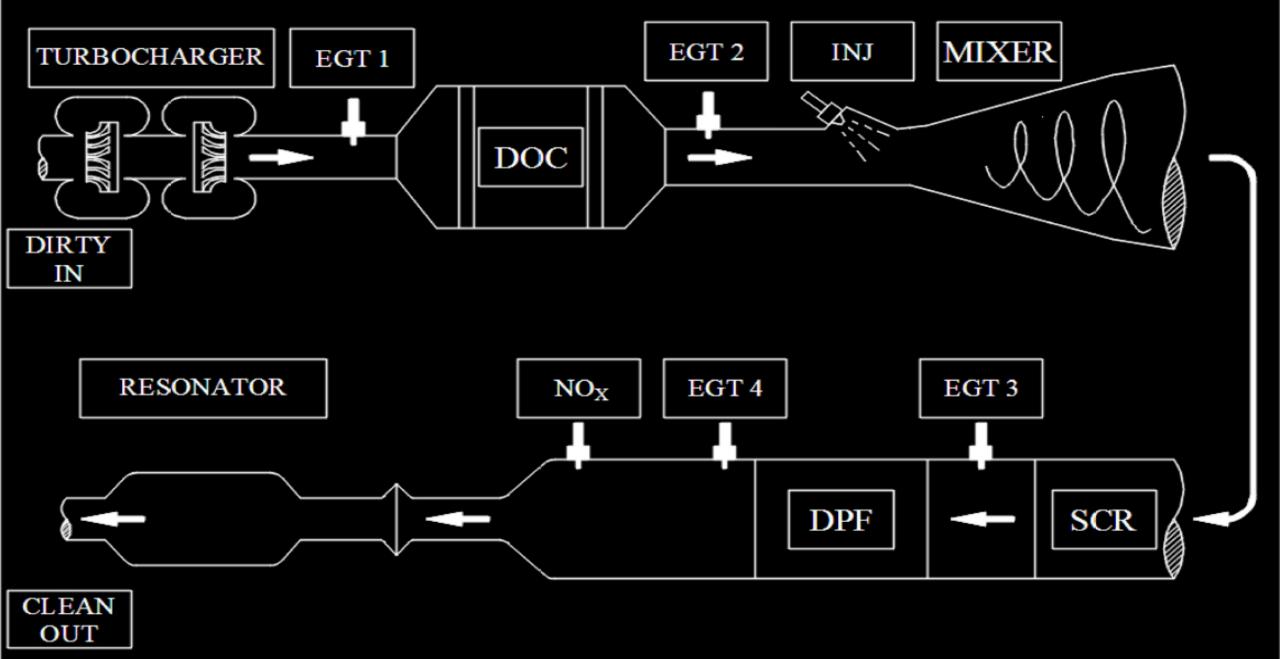




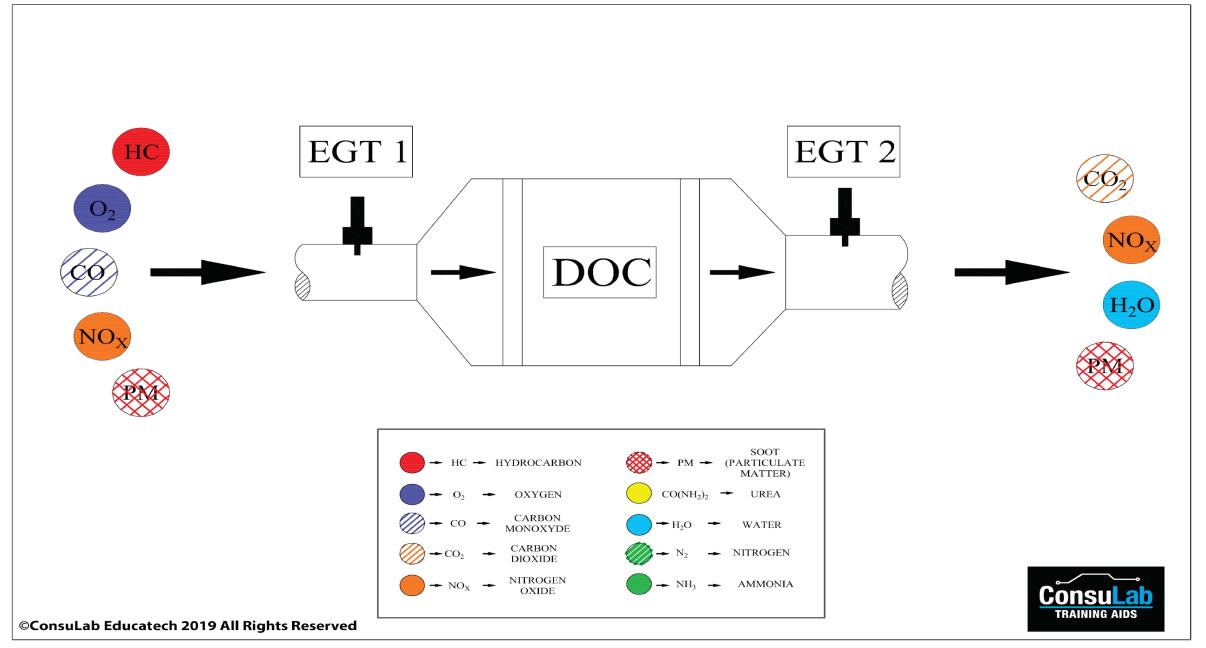


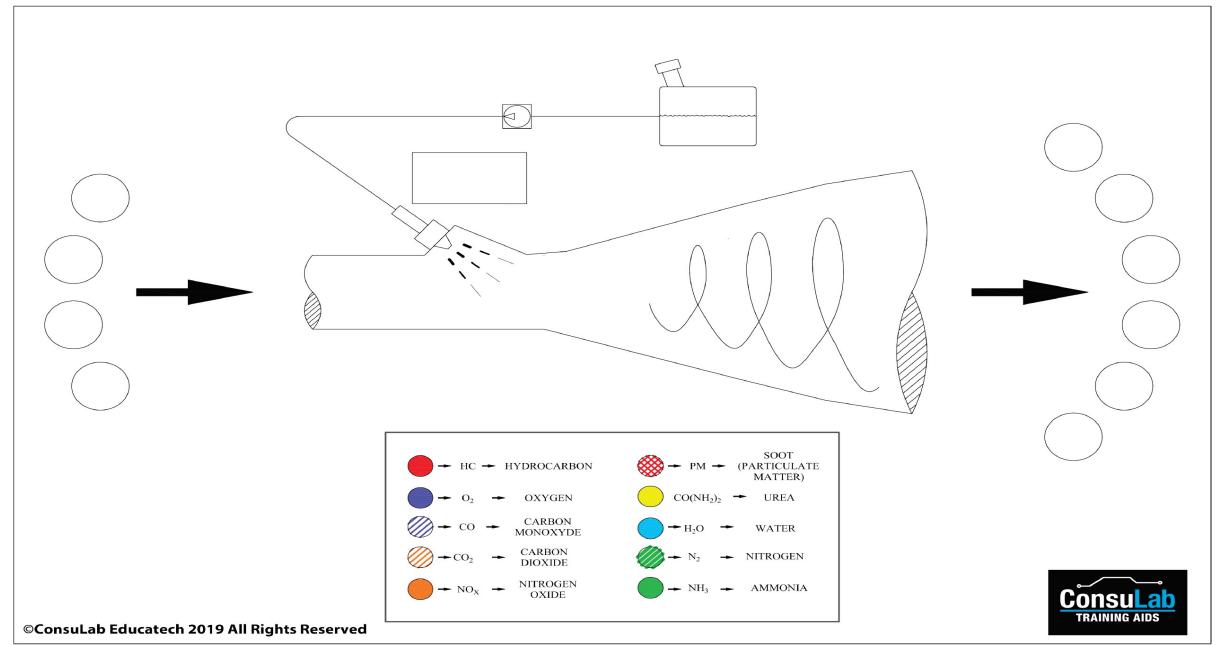


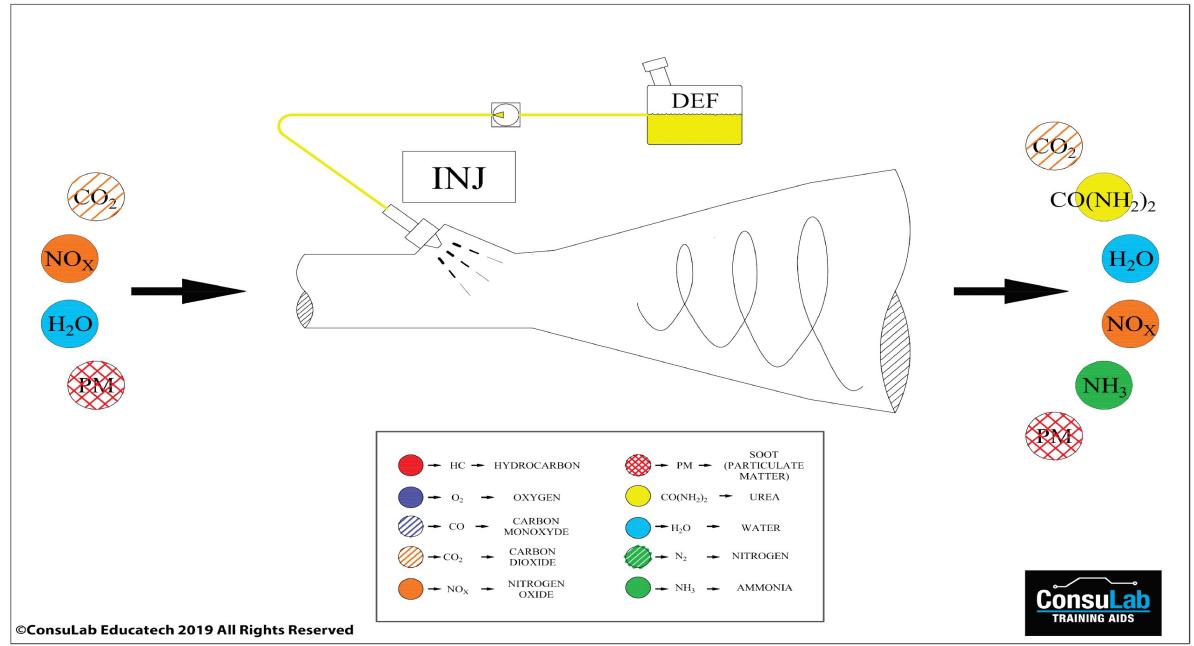
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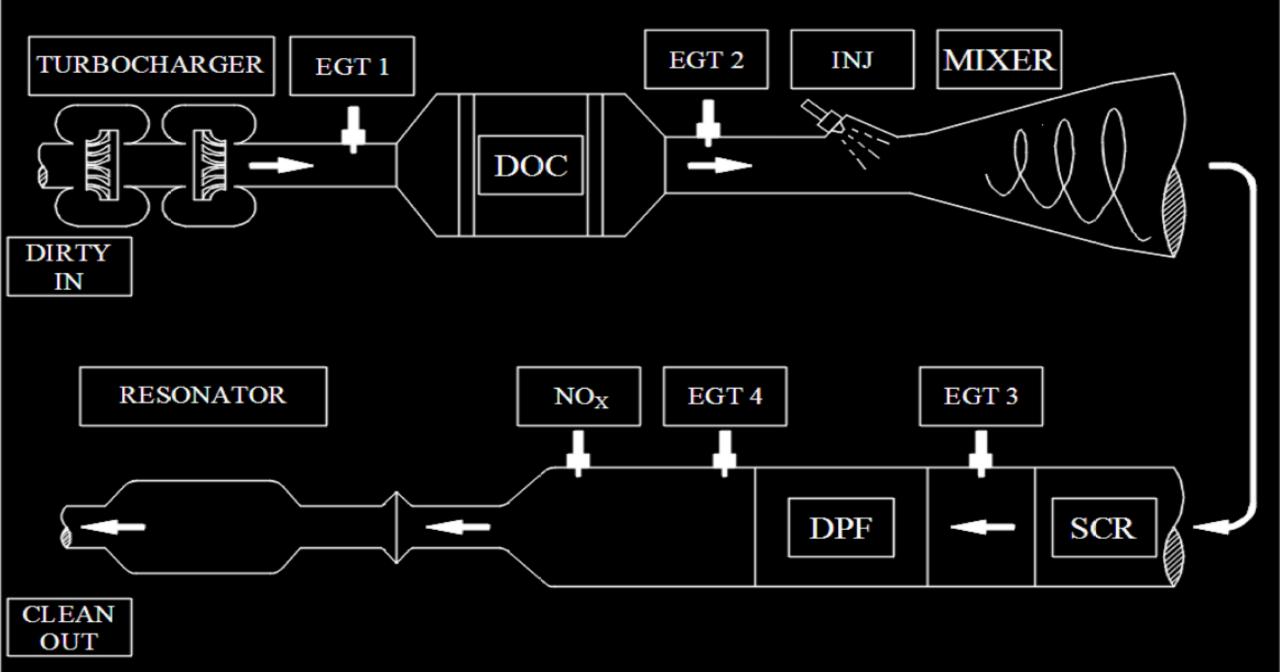


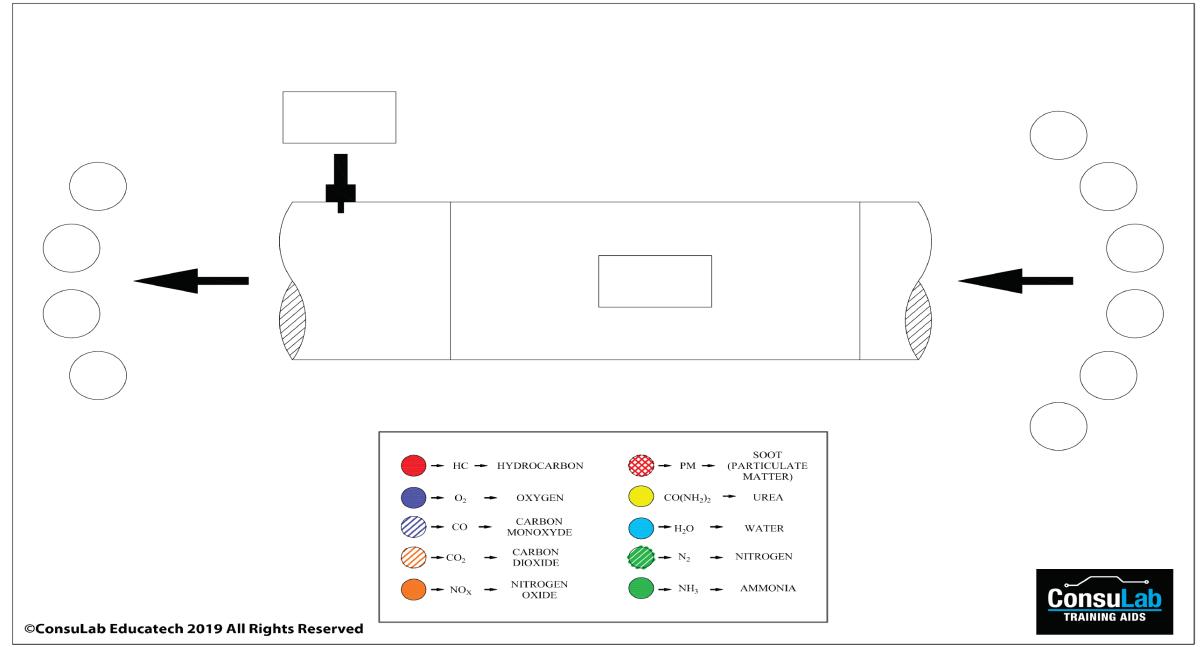
EC-490 ASSIGMENT #4



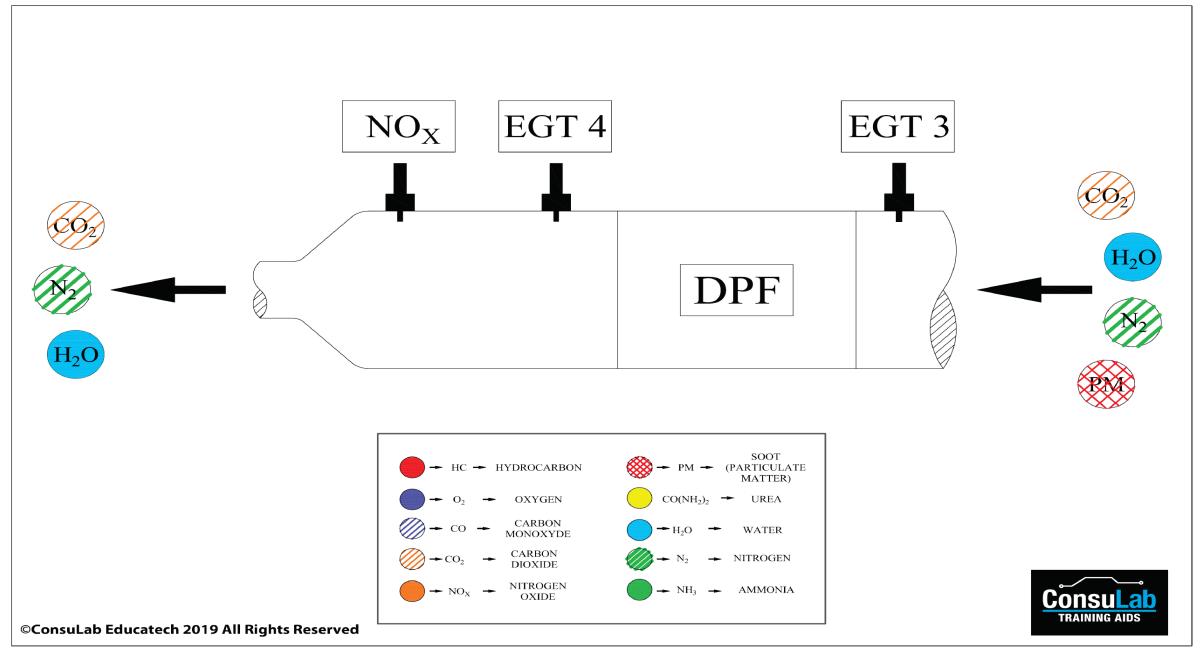








EC-490 ASSIGMENT #7





### Pause 1



**Diesel exhaust fluid** (**DEF**; also known as **AUS 32** and marketed as **AdBlue**) is a liquid used to reduce the amount of air pollution created by a diesel engine. Specifically, DEF is an aqueous urea solution made with 32.5% urea and 67.5% deionized water. DEF is consumed in selective catalytic reduction (SCR) that lowers nitrogen oxides ( $NO_X$ ) concentration in the diesel exhaust emissions from a diesel engine. [3]

Text is available under the Creative Commons Attribution-ShareAlike License-https://en.wikipedia.org/wiki/Diesel\_exhaust\_fluid

### Urea

From Wikipedia, the free encyclopedia

**Urea**, also known as **carbamide**, is an organic compound with chemical formula CO(NH<sub>2</sub>)<sub>2</sub>. This amide has two –NH<sub>2</sub> groups joined by a carbonyl (C=O) functional group.

### From cows?

#### **Constituents**

Further information: Urinalysis

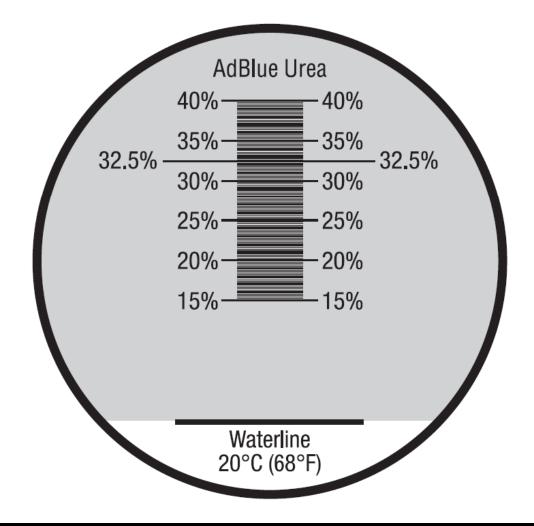
About 91-96% of urine consists of water.<sup>[3]</sup> Urine also contains an assortment of inorganic salts and organic compounds, including proteins, hormones, and a wide range of metabolites, varying by what is introduced into the body.

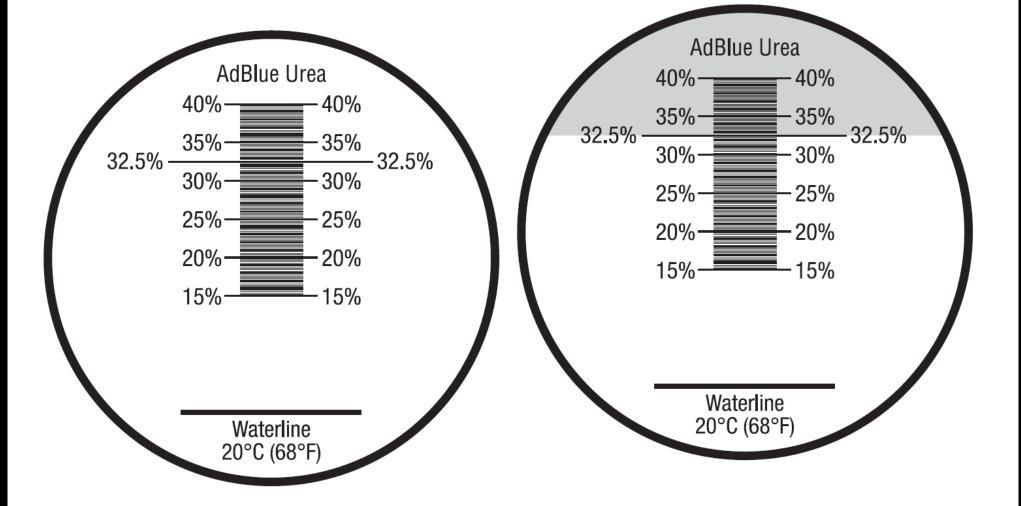
The total solids in urine are on average 59 g per person per day. Organic matter makes up between 65% and 85% of urine dry solids, with volatile solids comprising 75–85% of total solids. Urea is the largest constituent of the solids, constituting more than 50% of the total. On an elemental level, human urine contains 6.87 g/L carbon, 8.12 g/L nitrogen, 8.25 g/L oxygen, and 1.51 g/L hydrogen. The exact proportions vary with individuals and with factors such as diet and health. [3] In healthy persons, urine contains very little protein and an excess is suggestive of illness.



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The refractometer should now have a null point, and you are ready to begin measuring.





The scale without any liquid on the prism.

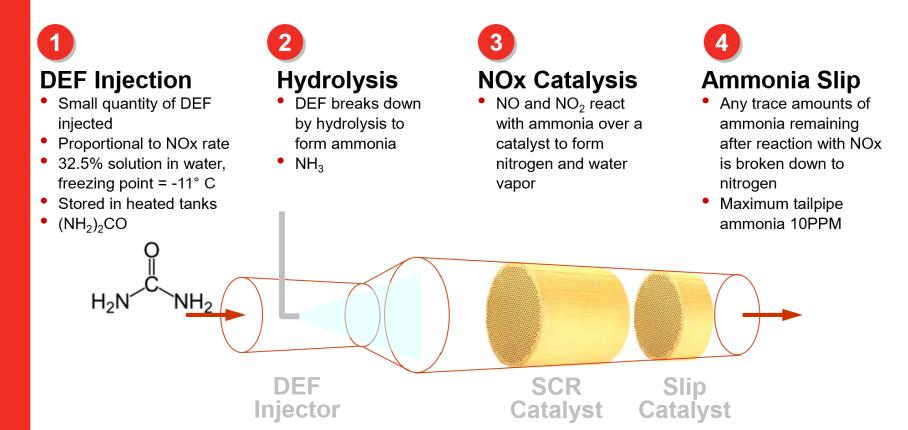
The scale with liquid on the prism.
The reading is taken at the point the shadow line crosses the scale.





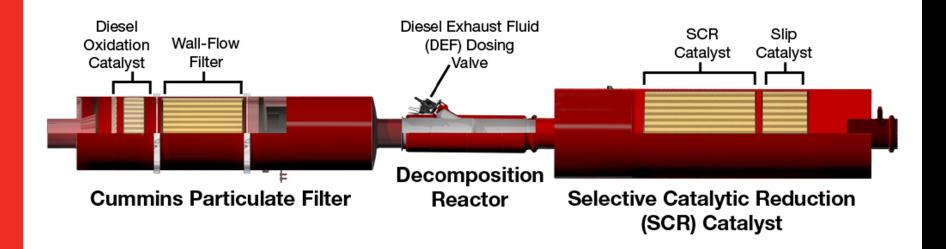
ourced 18 May 2020 at: https://www.amazon.com/dp/B07DLDZFJX/ref=cm\_sw\_em\_r\_mt\_dp\_U\_.FgXEb0E4D8C

### Selective Catalytic Reduction Fundamentals



### Cummins Aftertreatment System How it Works

- The Diesel Particulate Filter (DPF) collects and oxidizes carbon to remove particulate matter (PM) by more than 90%
- The SCR system reduces NOx levels by converting it to nitrogen and water
- The Decomposition Reactor connects the DPF and SCR catalysts, and includes the Diesel Exhaust Fluid (DEF) dosing valve



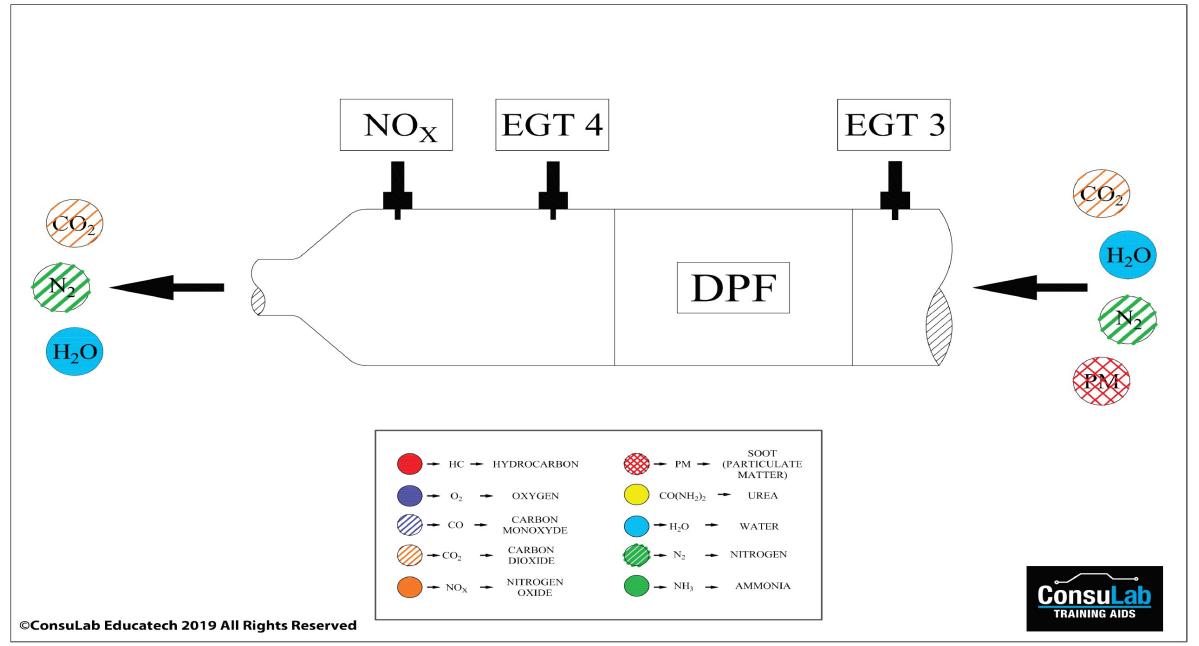
### Pause 2

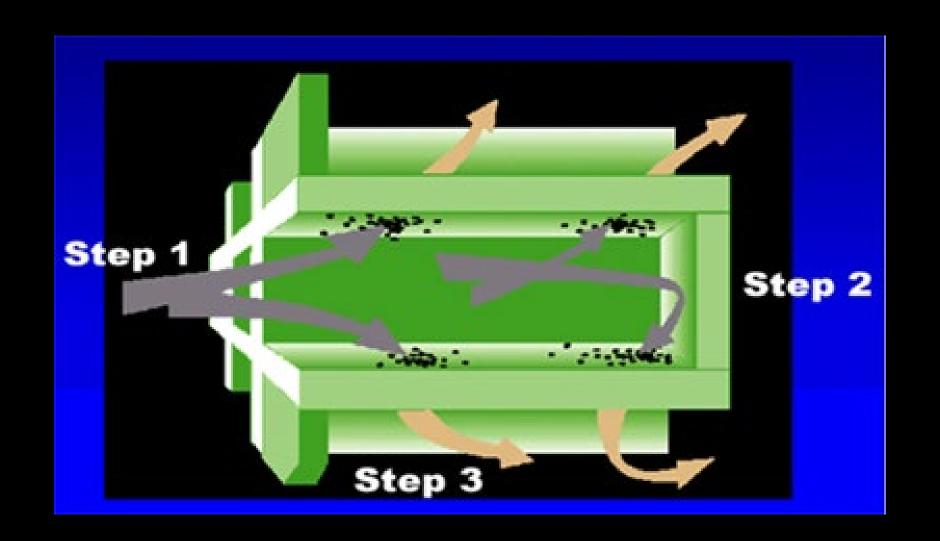
### https://youtu.be/RWeDm6QTxZE?t=659



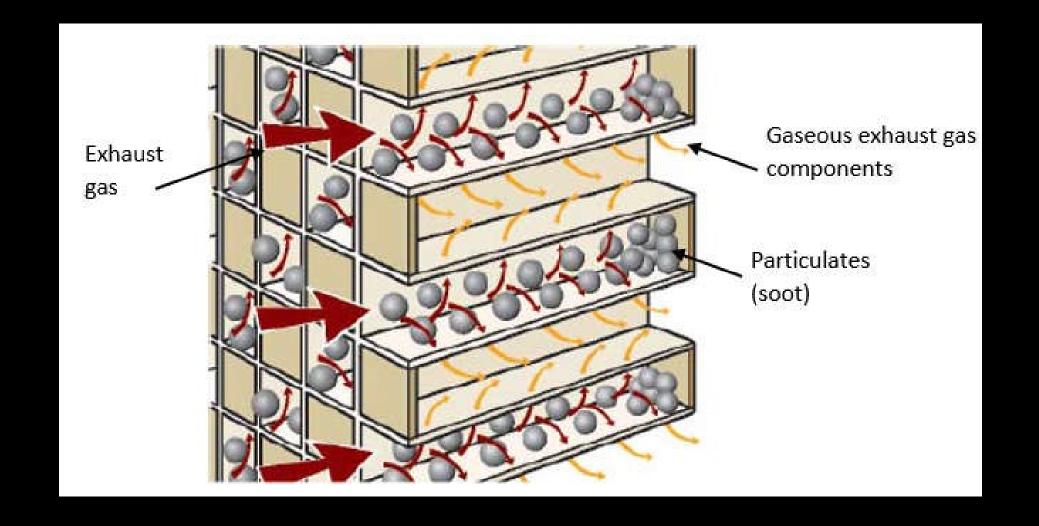
**AUTOPLAY** 

EC-490 ASSIGMENT #7









When you get into chemistry its all kind of foggy, but not to concerned about it.

Temp sensors data usage.

### Jeff Curtis

jcurtis@consulab.com



