

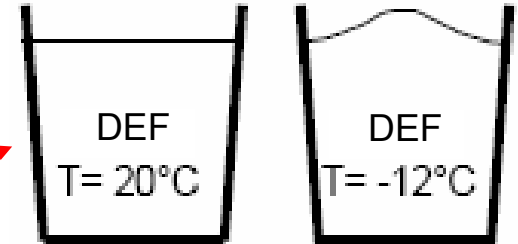
# UNDERSTANDING DEF

## ***\*SELECT AN OPTION***

- **WHAT IS DEF (DIESEL EXHAUST FLUID)**
- **DEF FACTS**
- **DEF TANK SYSTEM**
- **DEF SUPPLY MODULE (PUMP)**
- **DEF SUPPLY LINES**
- **DEF INJECTOR (DOSING MODULE)**
- **DOSING CONTROL UNIT (DCU)**
- **OVERALL DEF SYSTEM PICTORAL**

## What is DEF (Diesel Exhaust Fluid)?

- DEF is a 32.5% urea water solution, as per ISO 22241
  - Maximum pH 9.75
  - Viscosity at 25°C 1.4 mPA
  - Density at 20°C 1.085 kg/L
  - Freezing point -11°C
- Must allow a minimum for 12% freeze expansion
- Nontoxic; not hazardous material
- Is very corrosive.
  - Not compatible with low carbon steels
  - Compatible with most plastics, rubbers, and stainless steel
- At elevated temperatures urea vaporizes into ammonia



### ● **OPTIONS**

## DEF Facts

- Will creep through porous openings
- Will crystallize after dehydration
  - Not hazardous but unsightly and causes odor
- At evaluated temps urea vaporizes into ammonia
  - Rapid decomposition occurs above 50°C
- Typical consumption rate is 1.6% – 2% of Diesel fuel consumption.
- DEF has a shelf life that is temperature dependent
- DEF represents no danger to the environment
- Non-flammable



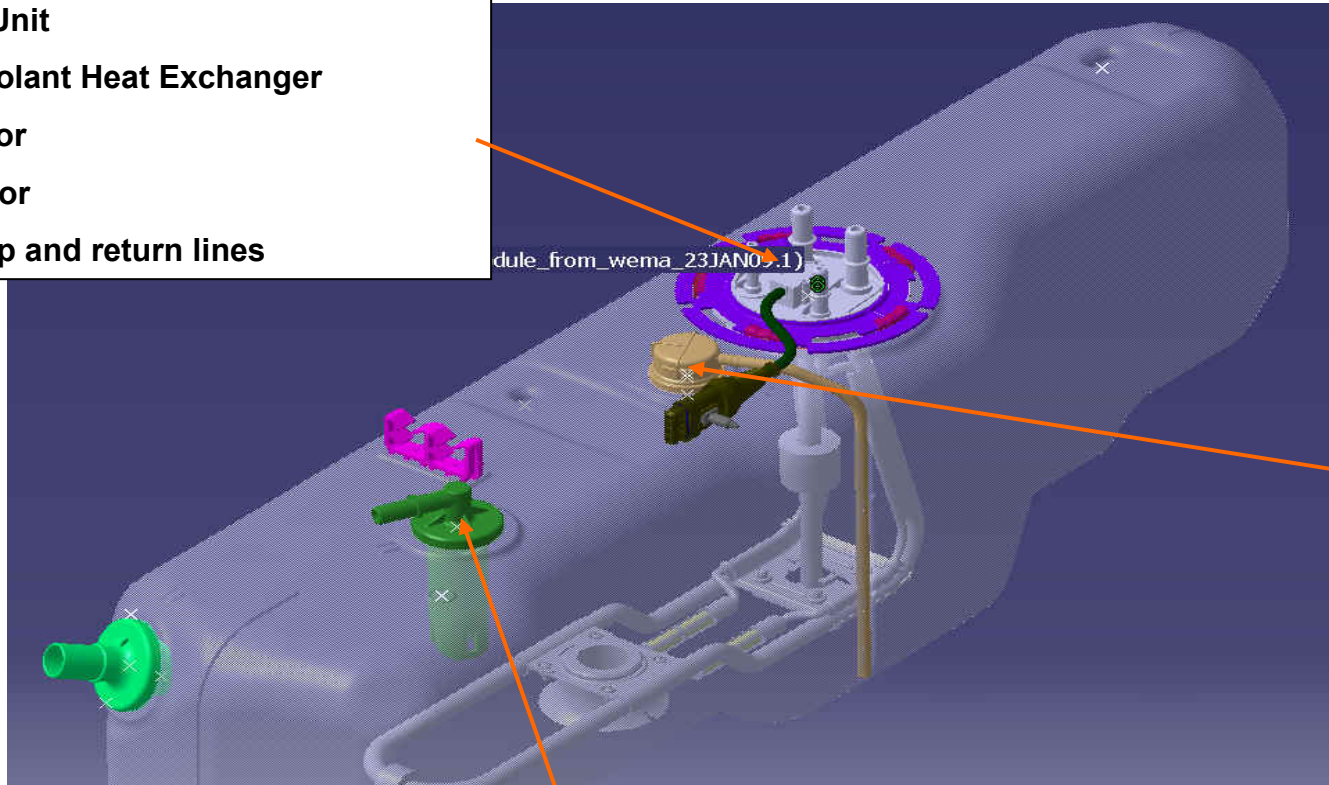
Temperature (Constant)	Estimated Pot life
0 °C	∞
10 °C	75 years
20 °C	11 years
30 °C	23 months
35 °C	10 months
40 °C	4 months
50 °C	1 month
60 °C	1 week

## ● **OPTIONS**

## DEF Tank System

### Functional Unit

- Engine Coolant Heat Exchanger
- Level Sensor
- Temp Sensor
- DEF Pick-up and return lines



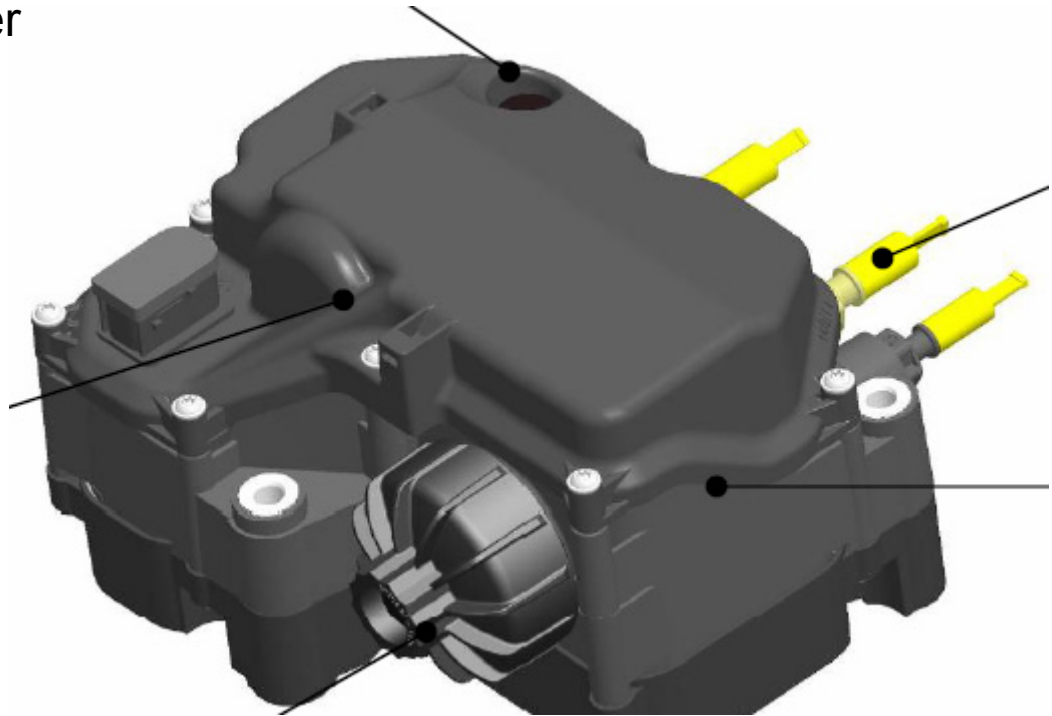
**Vent  
Valve**

**Fluid Limit  
vent valve**

● **OPTIONS**

## DEF Supply Module (Pump)

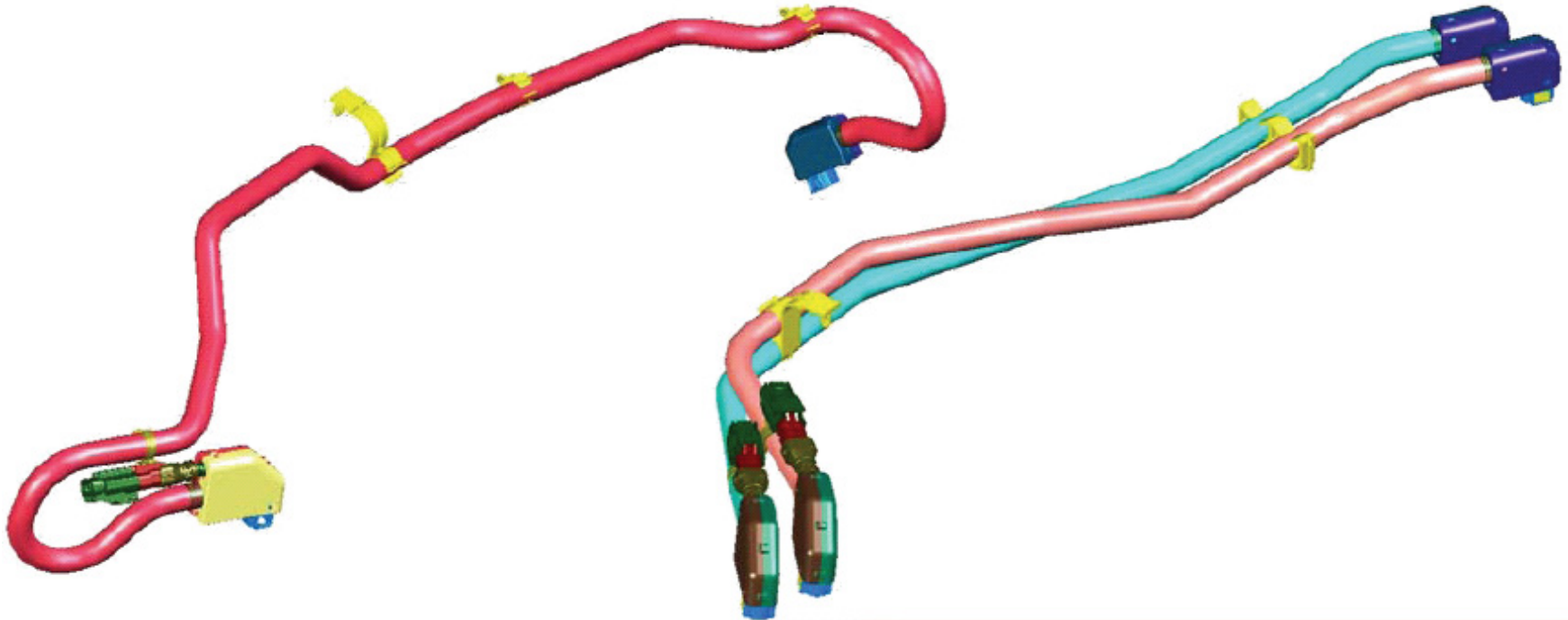
- Operating pressure 9 bar.
- Capable of reverse flow to evacuate system on shut-down
- Lifetime serviceable filter
- Electrically heated



● **OPTIONS**

## DEF Supply Lines

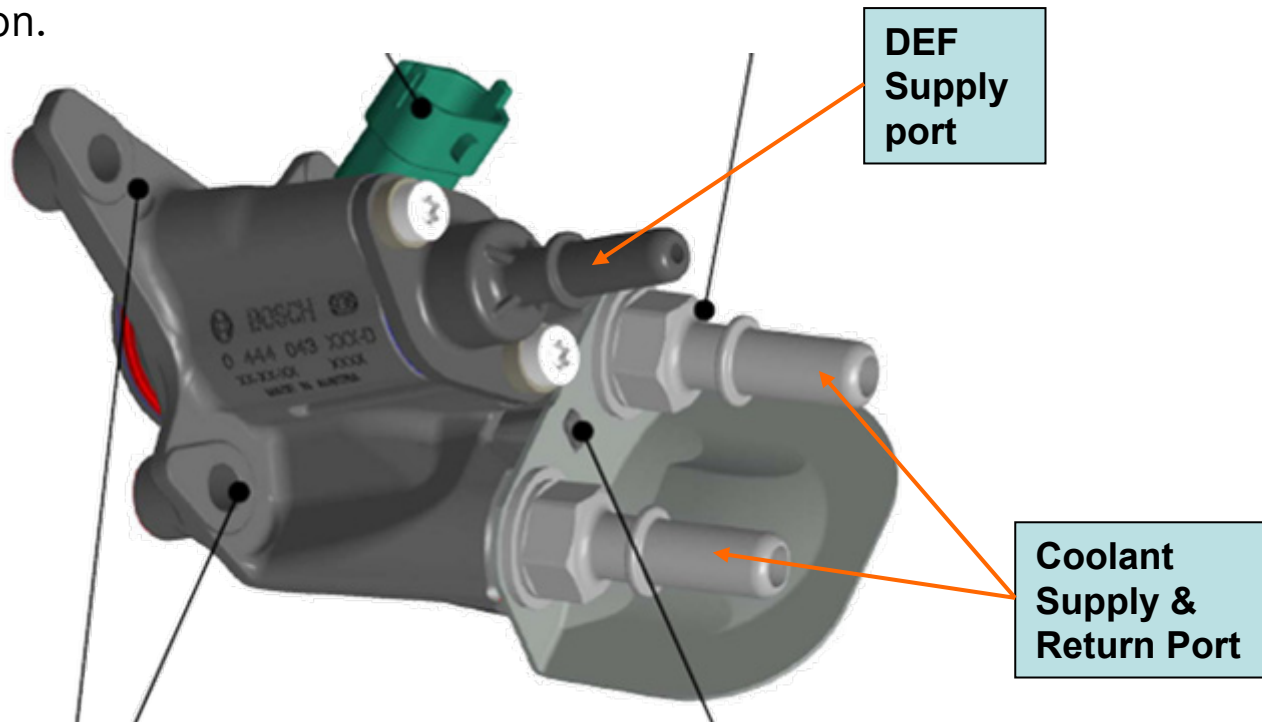
- Heating required along entire path (lines and connectors)
- Connection method similar to fuel lines



● **OPTIONS**

## DEF Injector (Dosing Module)

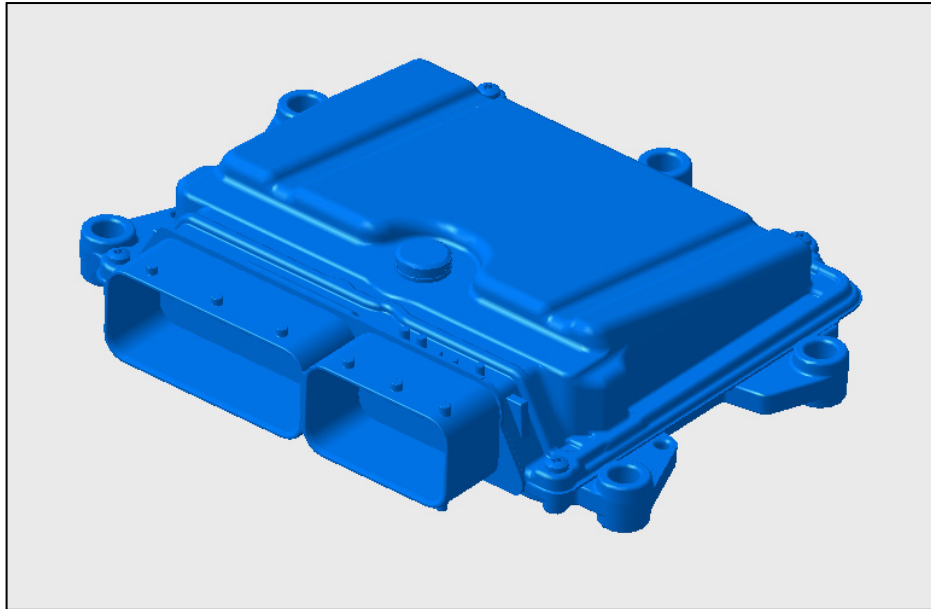
- Similar to fuel injectors (modified to be compatible with urea and to operate in underbody environment)
- Typically require mixing device in exhaust pipe to improve atomization and dispersion.



● **OPTIONS**

## Dosing Control Unit (DCU)

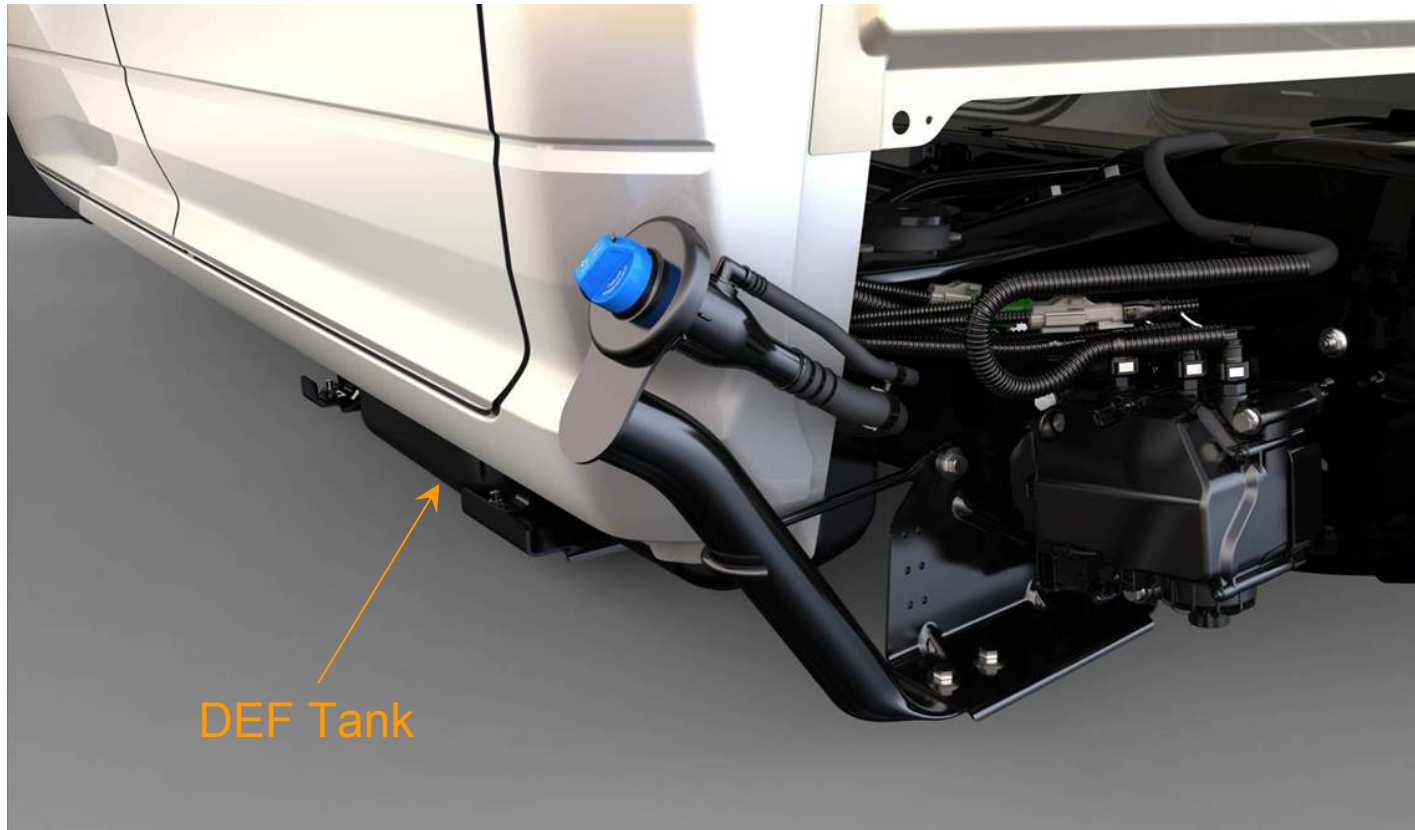
- Controls the function of the urea “wet system” (heaters, pump, injector, etc...)
- Receives signal from ECU when to inject



● **OPTIONS**

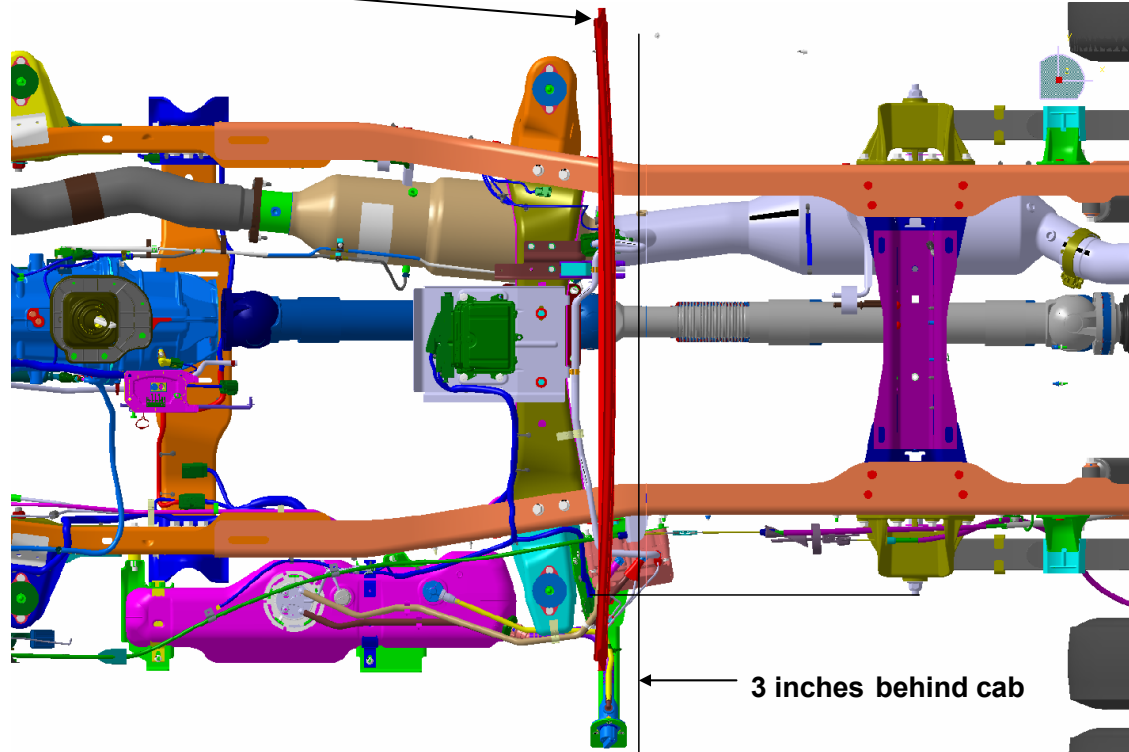


View from behind drivers door



● **NEXT**

Back of Cab Sheet Metal



If an applied body is installed "industry standard" 3" behind the cab there is adequate clearance to the DEF system

● **OPTIONS**