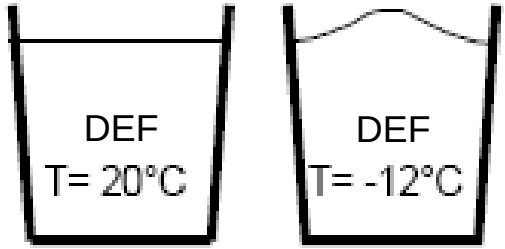
What is DEF (Diesel Exhaust Fluid)?

- 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



DEF Facts

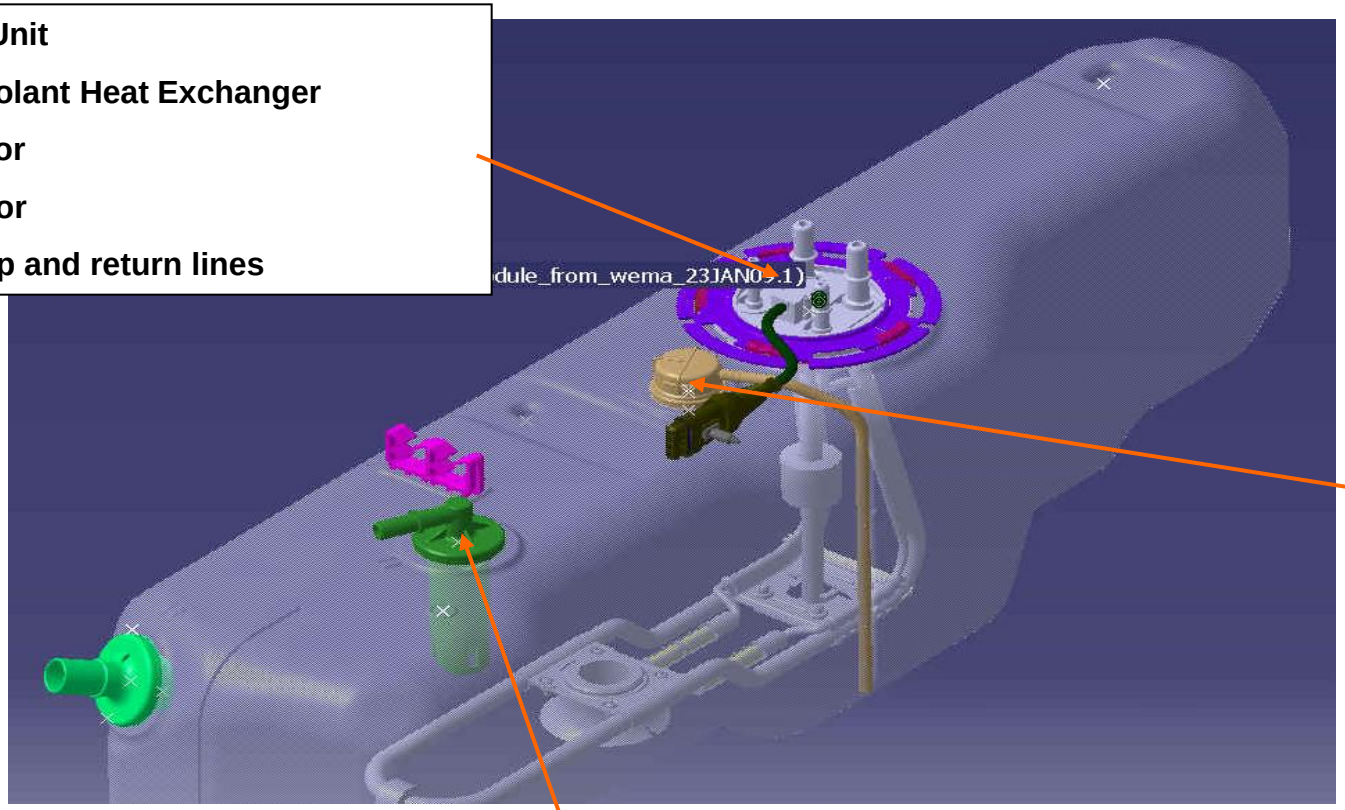
- Will creep through porous openings
- Will crystallize after dehydration
  - Not hazardous but unsightly and causes odor
- At evaluated temps urea vaporizes into ammonia
  - Rapid decomposition occurs above 50°C
- Typical consumption rate is 1.6% – 2% of Diesel fuel consumption.
- DEF has a shelf life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

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

DEF Tank System

Functional Unit

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

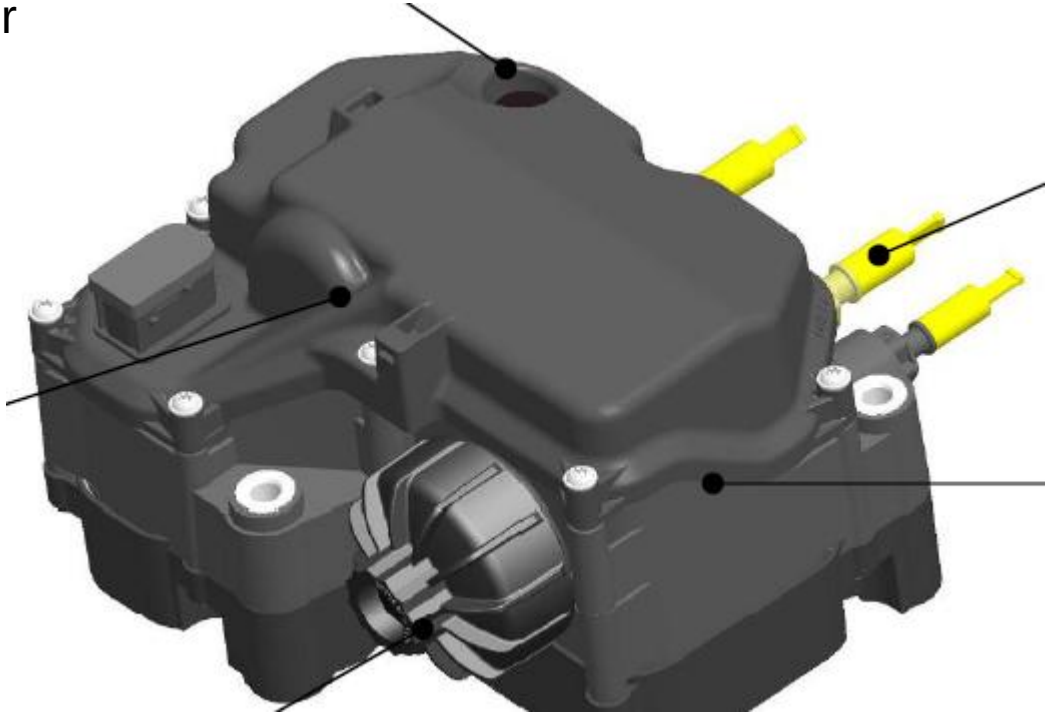


Vent Valve

Fluid Limit vent valve

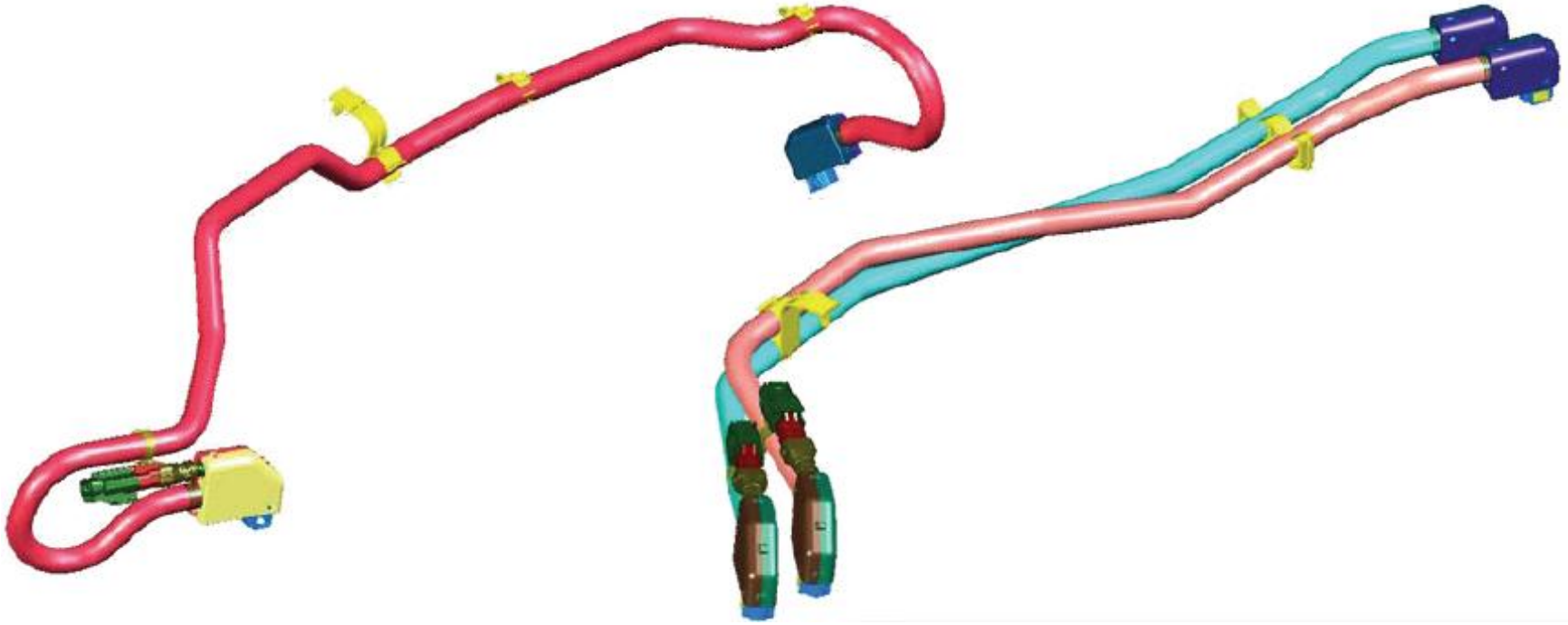
DEF Supply Module (Pump)

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



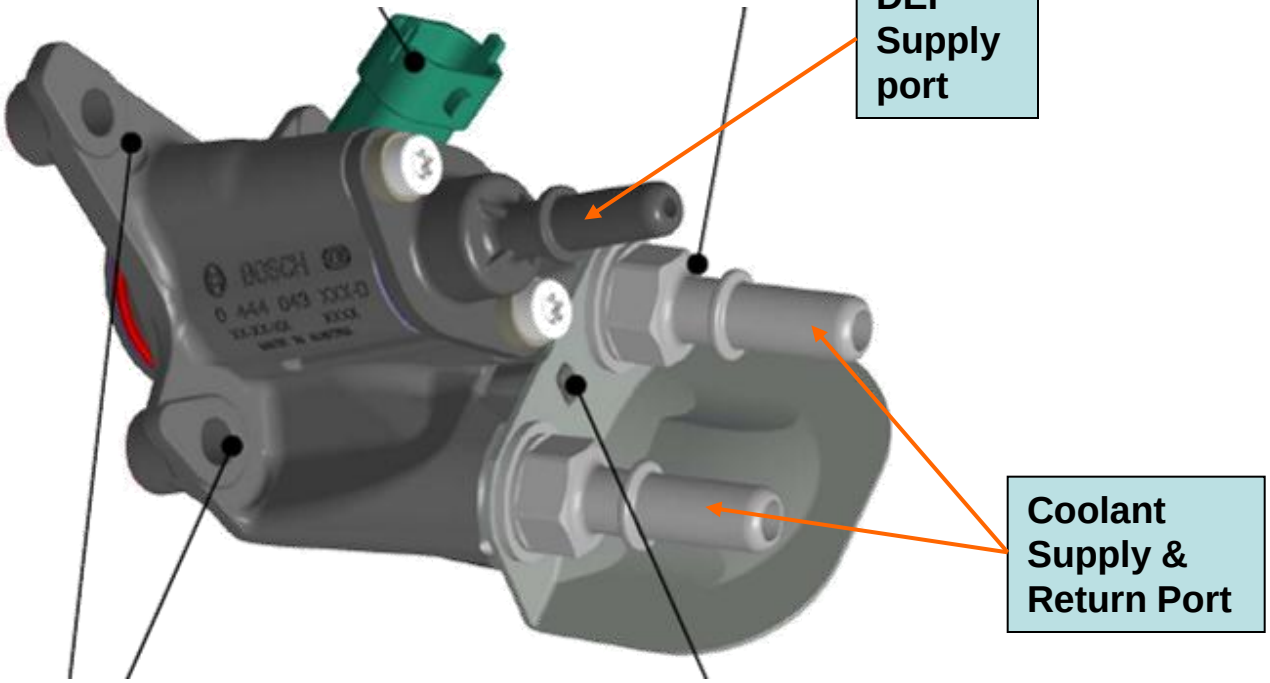
DEF Supply Lines

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



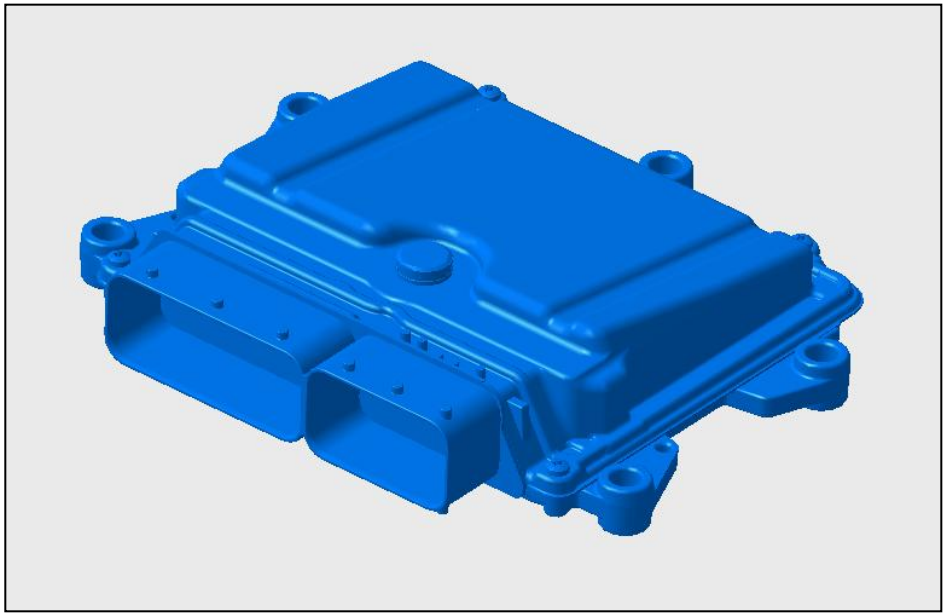
DEF Injector (Dosing Module)

- 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.

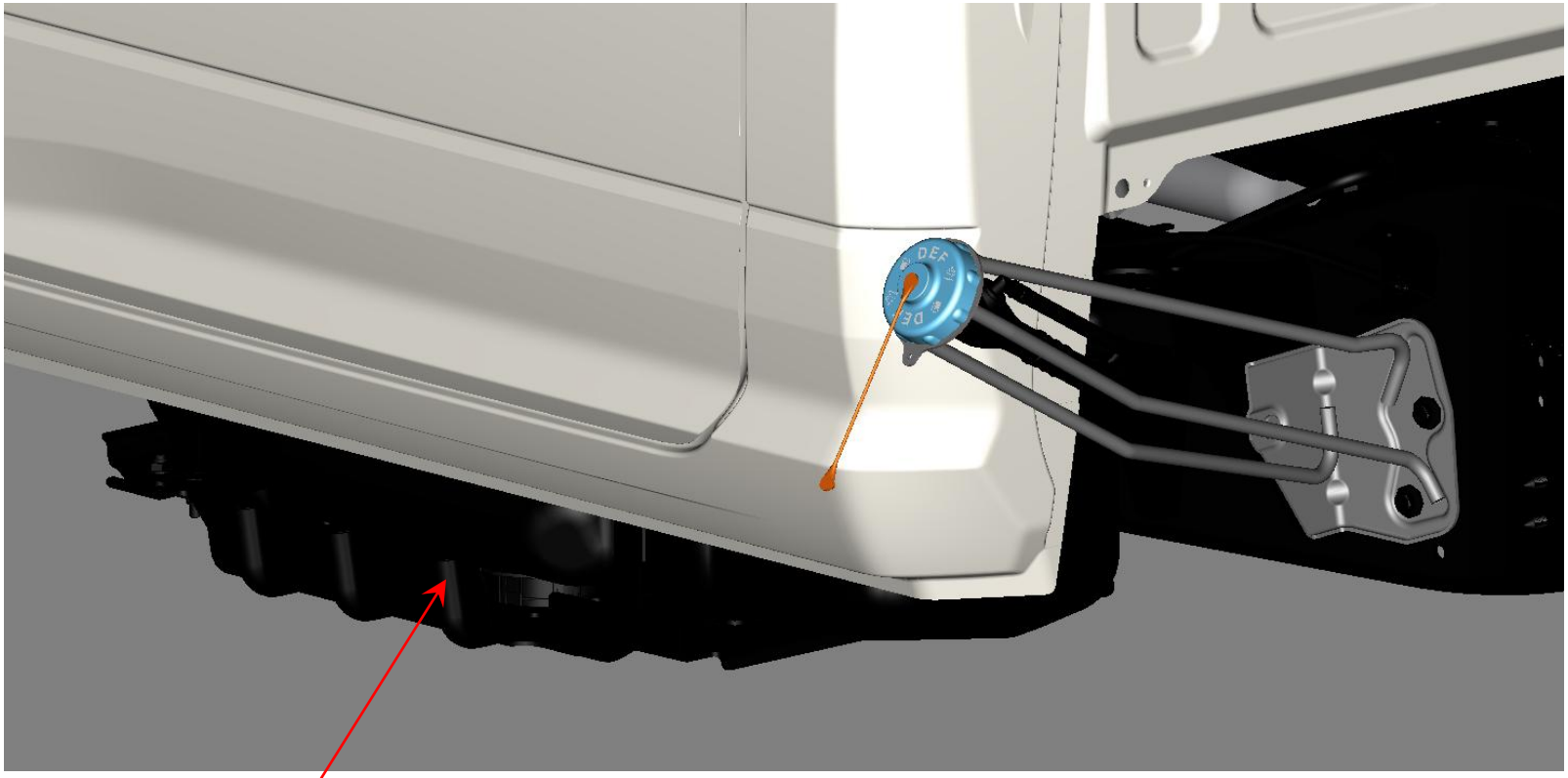


Dosing Control Unit (DCU)

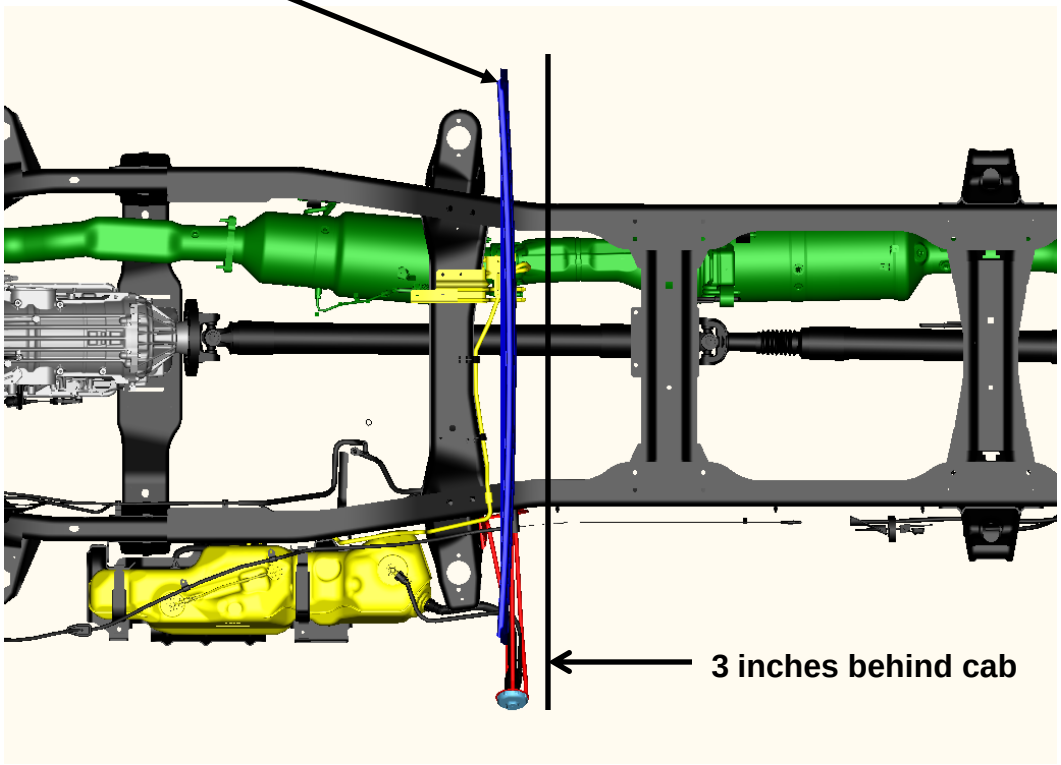
- Controls the function of the urea “wet system” (heaters, pump, injector, etc…)
- Receives signal from ECU when to inject



View from behind drivers door



Understanding DEF (Diesel Exhaust Fluid)



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