

DETROIT DIESEL

DEMAND PERFORMANCESM



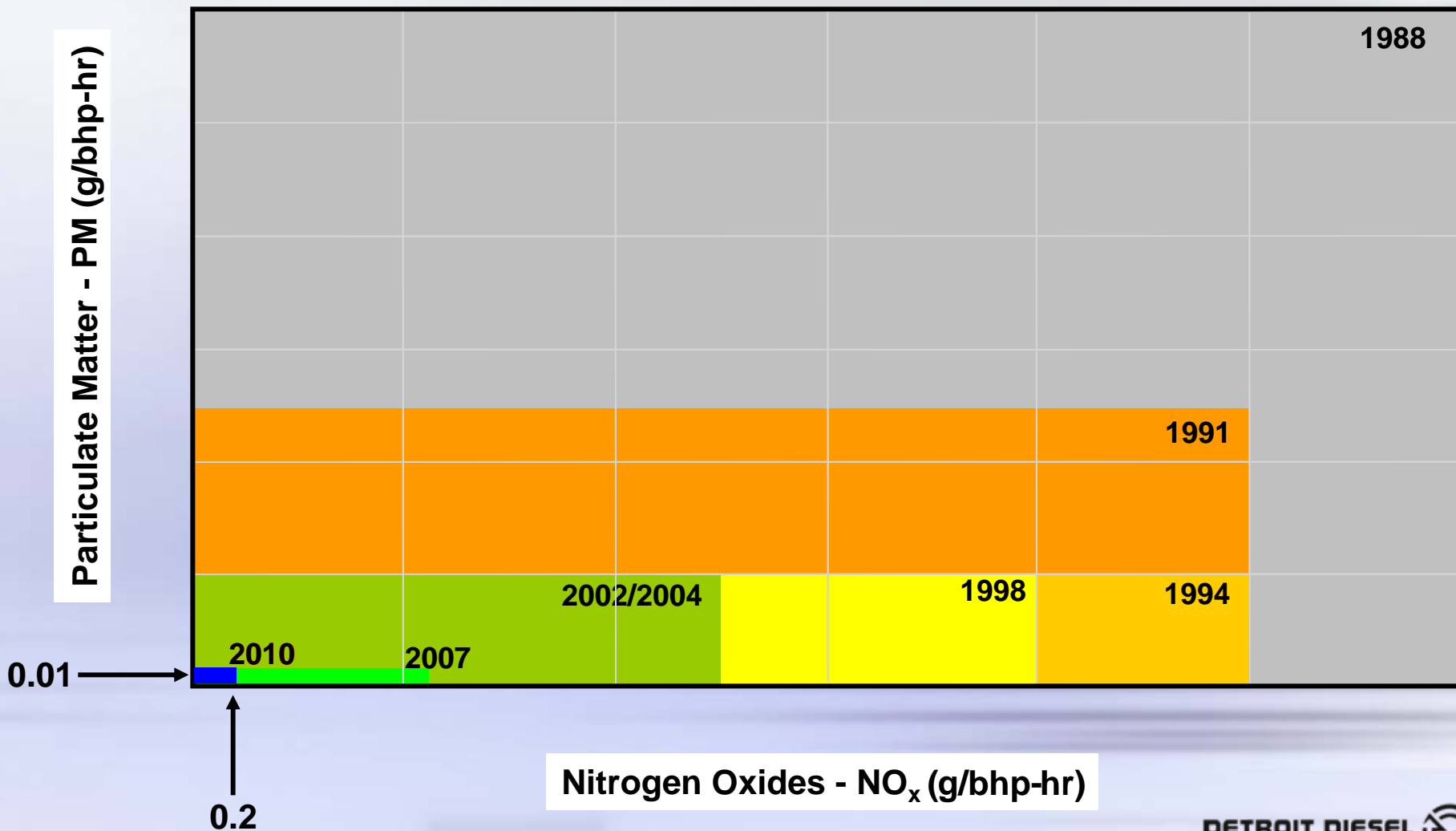
Freightliner and Detroit Diesel 2010

Ryan Valley

Detroit Diesel Sales Manager

22 Years of Truck Emission Changes

We have come a long way toward truly clean diesel technology. Detroit Diesel's BlueTec Emissions Technology meets the stringent EPA10 standards of 0.01 grams / bhp-hr PM and 0.2 grams / bhp-hr NO_x.

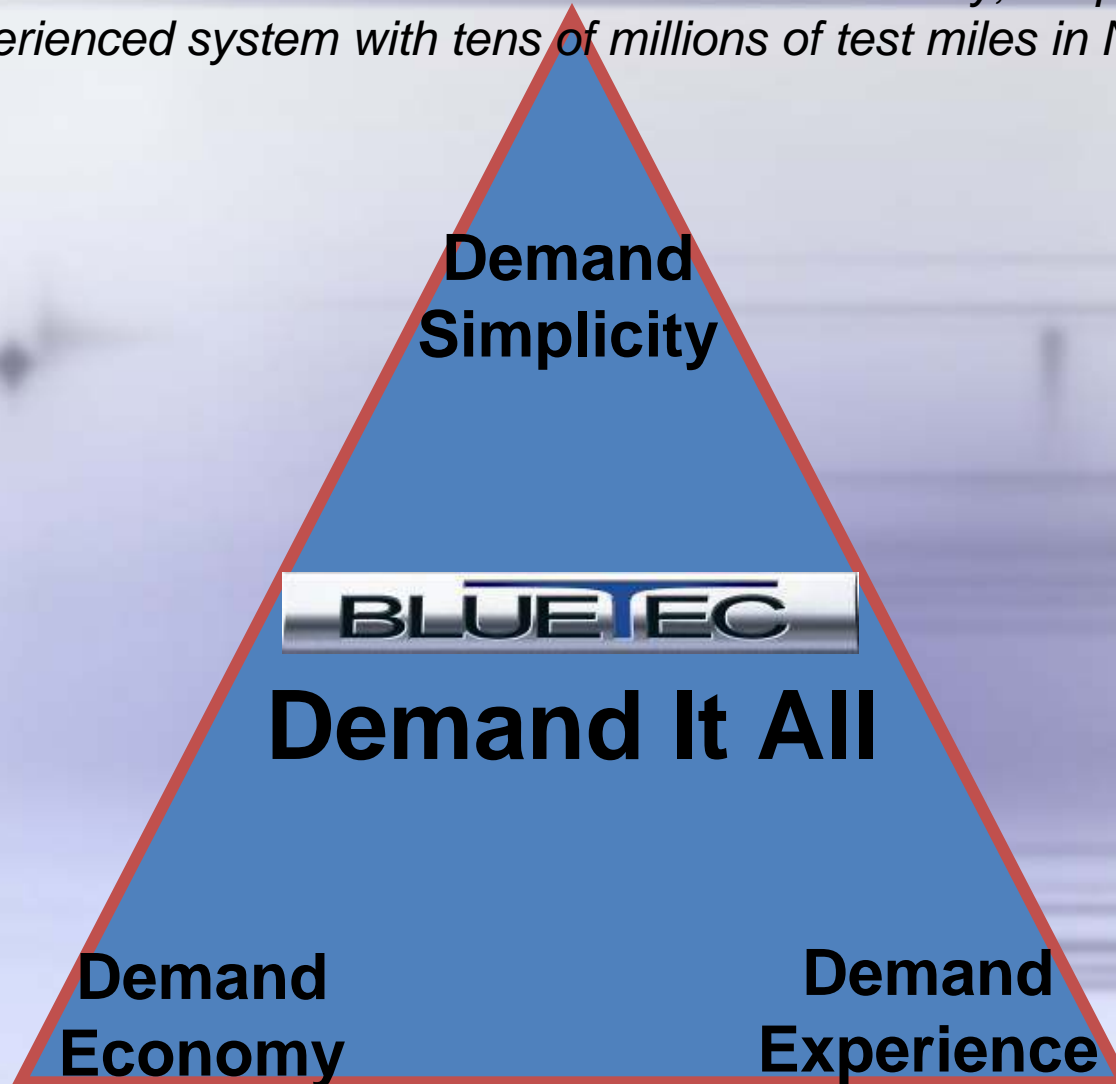


BLUETEC

**ECONOMY
SIMPLICITY
EXPERIENCE
DEMAND IT ALL**

Why BlueTec?

BlueTec is Detroit Diesel's emissions technology used to meet the EPA10 emissions regulations. BlueTec delivers better fuel economy, simple operations and is an experienced system with tens of millions of test miles in North America.



How It Works and New Components

How BlueTec Works

Exhaust leaves the engine with the pollutants NOx and PM

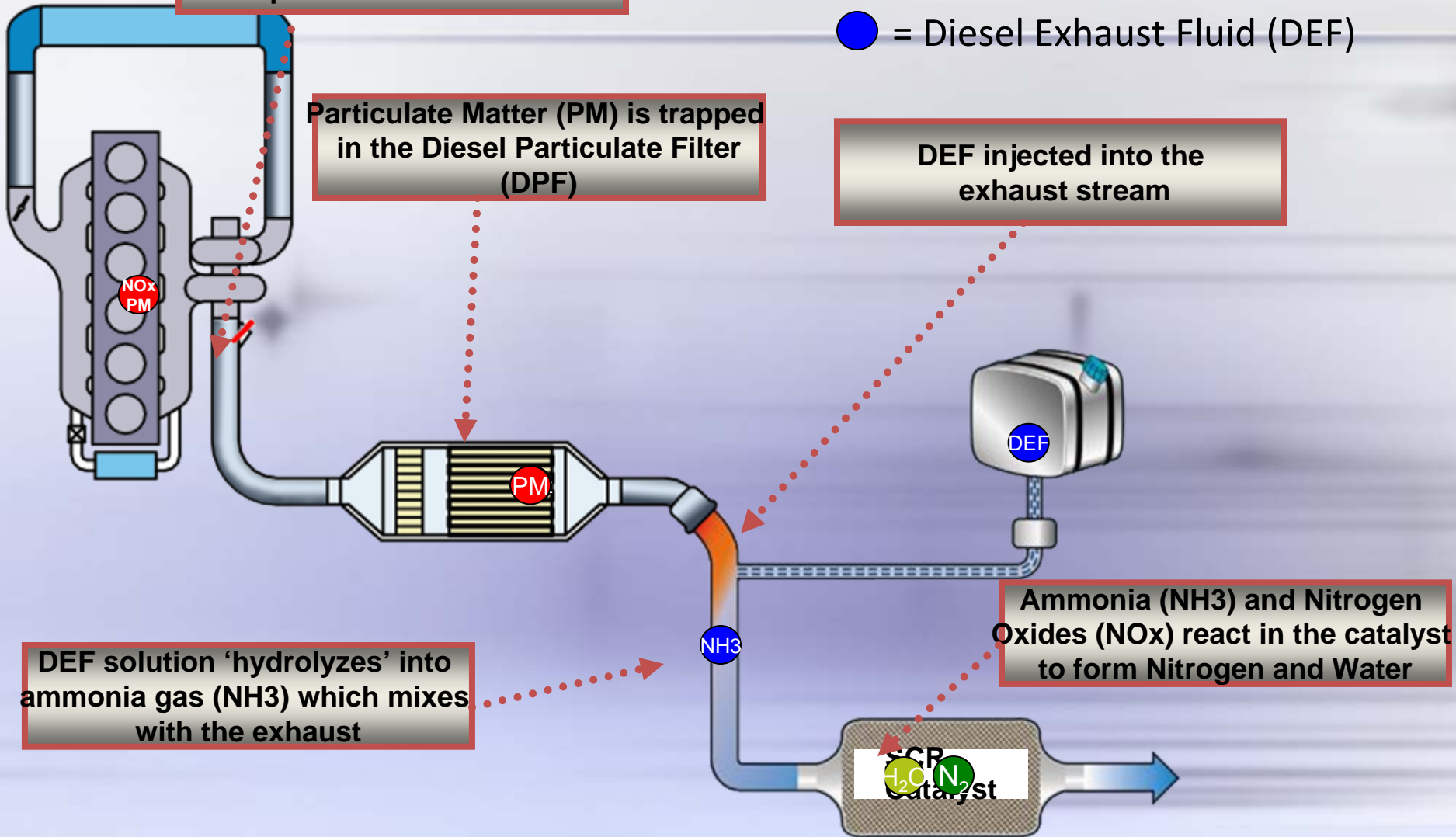
- = Exhaust
- = Diesel Exhaust Fluid (DEF)

Particulate Matter (PM) is trapped in the Diesel Particulate Filter (DPF)

DEF injected into the exhaust stream

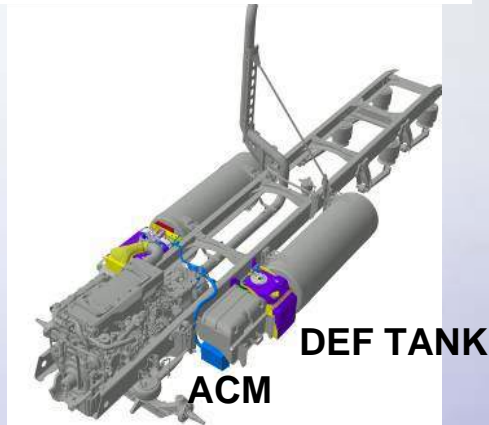
DEF solution 'hydrolyzes' into ammonia gas (NH₃) which mixes with the exhaust

Ammonia (NH₃) and Nitrogen Oxides (NOx) react in the catalyst to form Nitrogen and Water

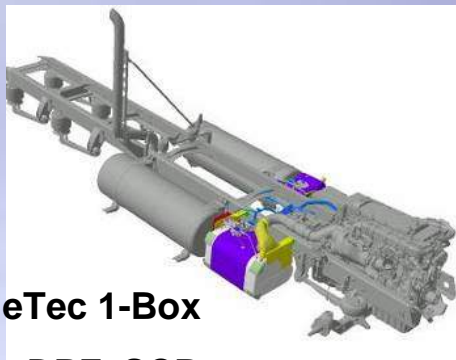
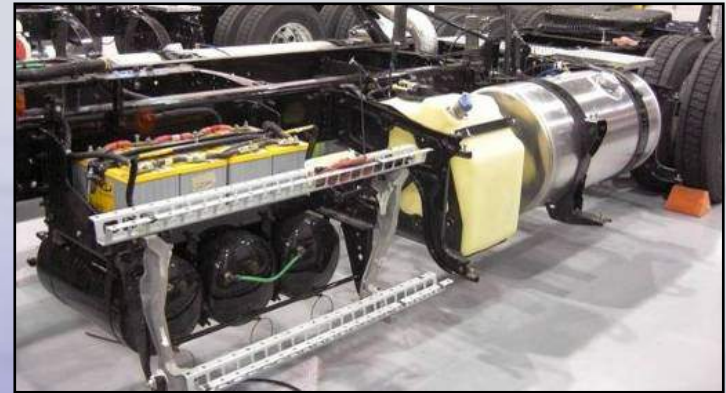


3 Key New Components

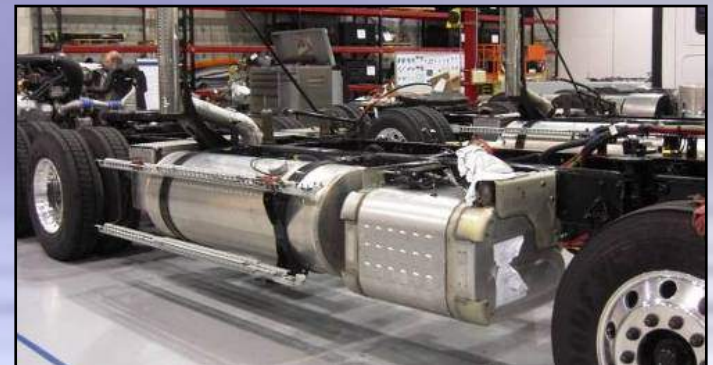
BlueTec technology will add 3 key components [DEF tank, 1-Box configuration or 2-box configuration, Aftertreatment Control Module (ACM)] as well as some supporting hardware to the 2010 product offering. Notice how seamlessly the 1-box SCR system fits into the chassis.



Left View



Right View

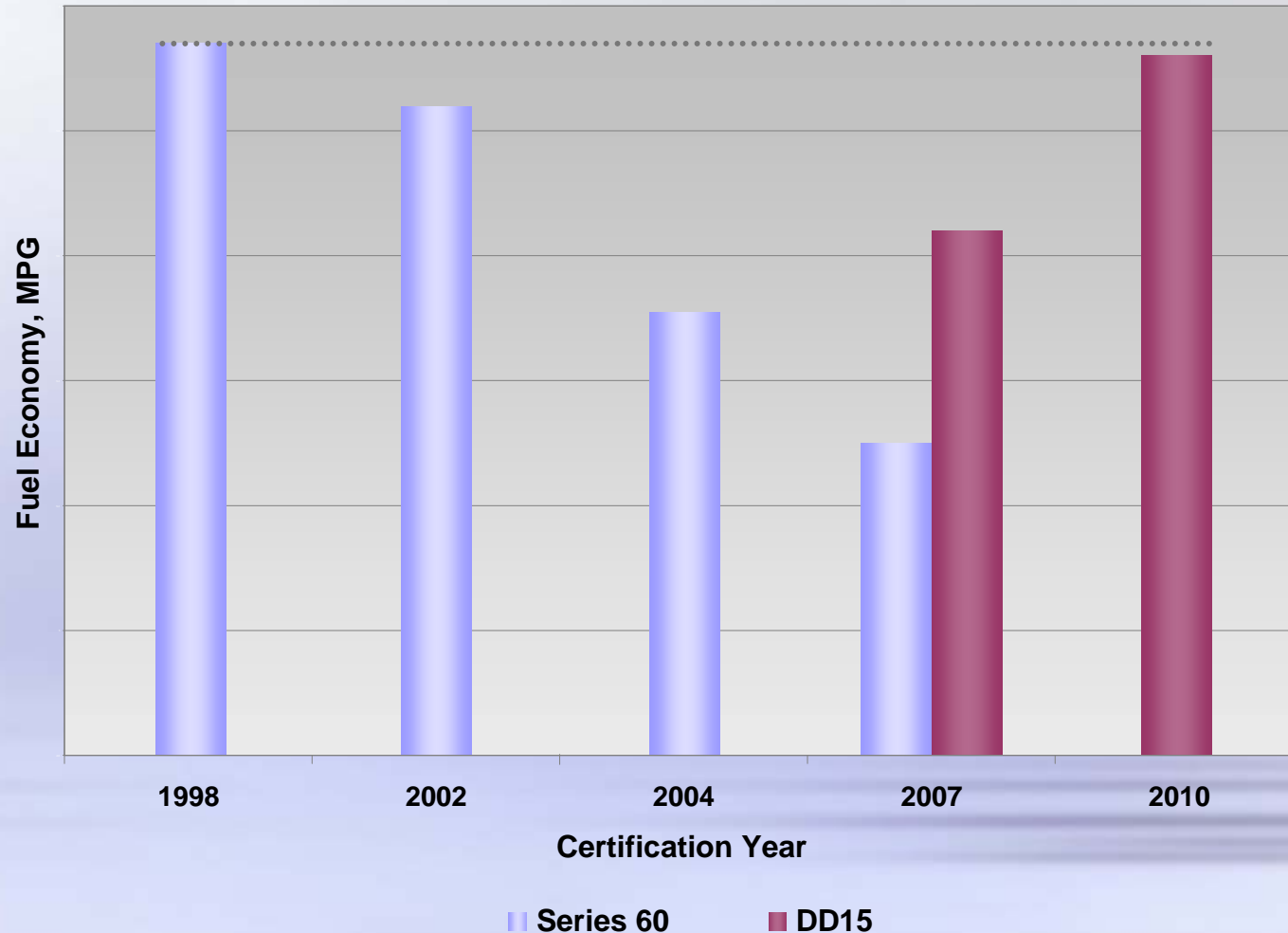


**BlueTec 1-Box
(DOC, DPF, SCR
Catalyst)**

Demand Economy

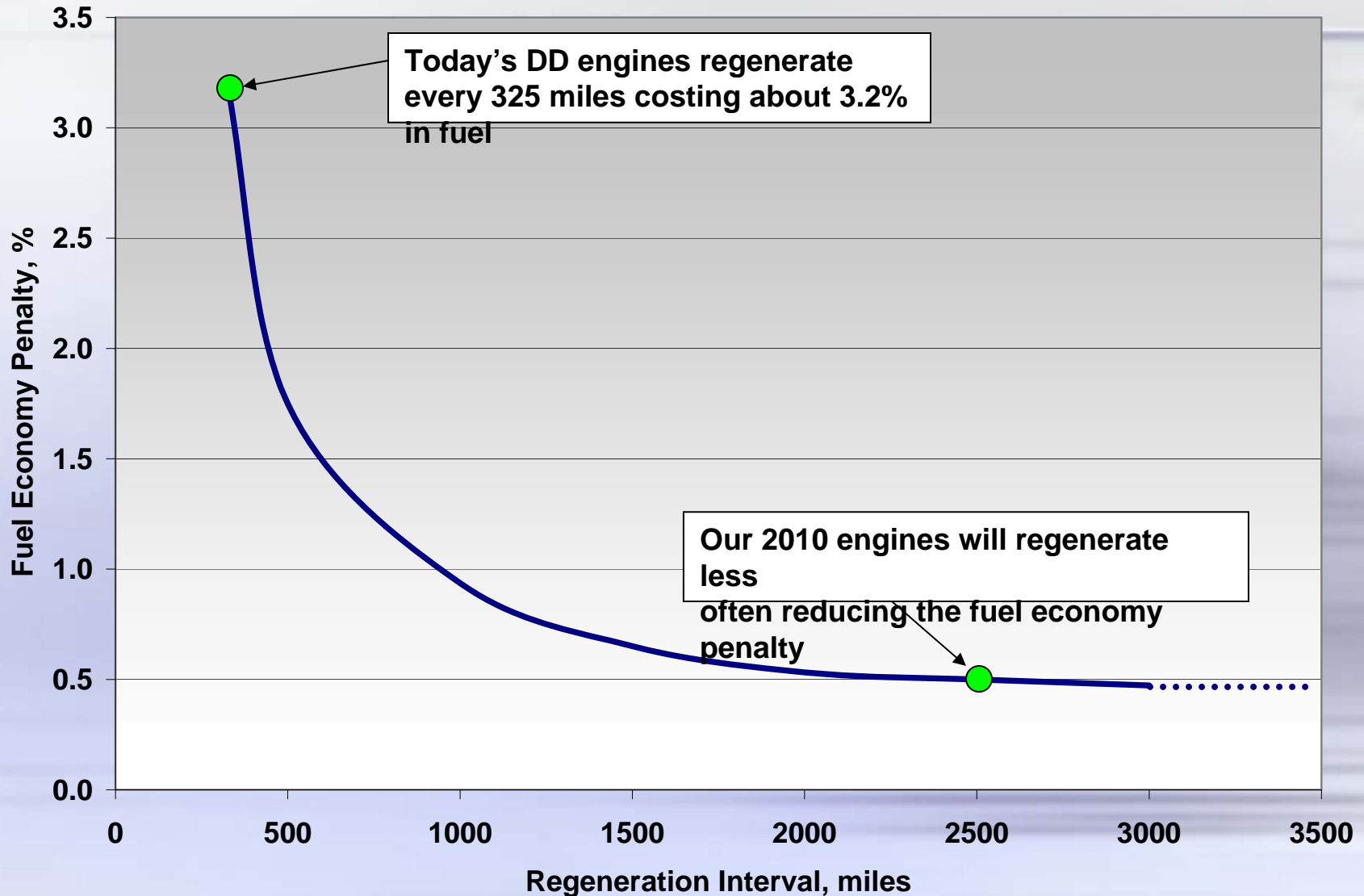
Demand Economy

For the first time Detroit Diesel can meet the emissions regulations in the exhaust stream rather than in cylinder, getting back to pre-EGR fuel economy numbers.



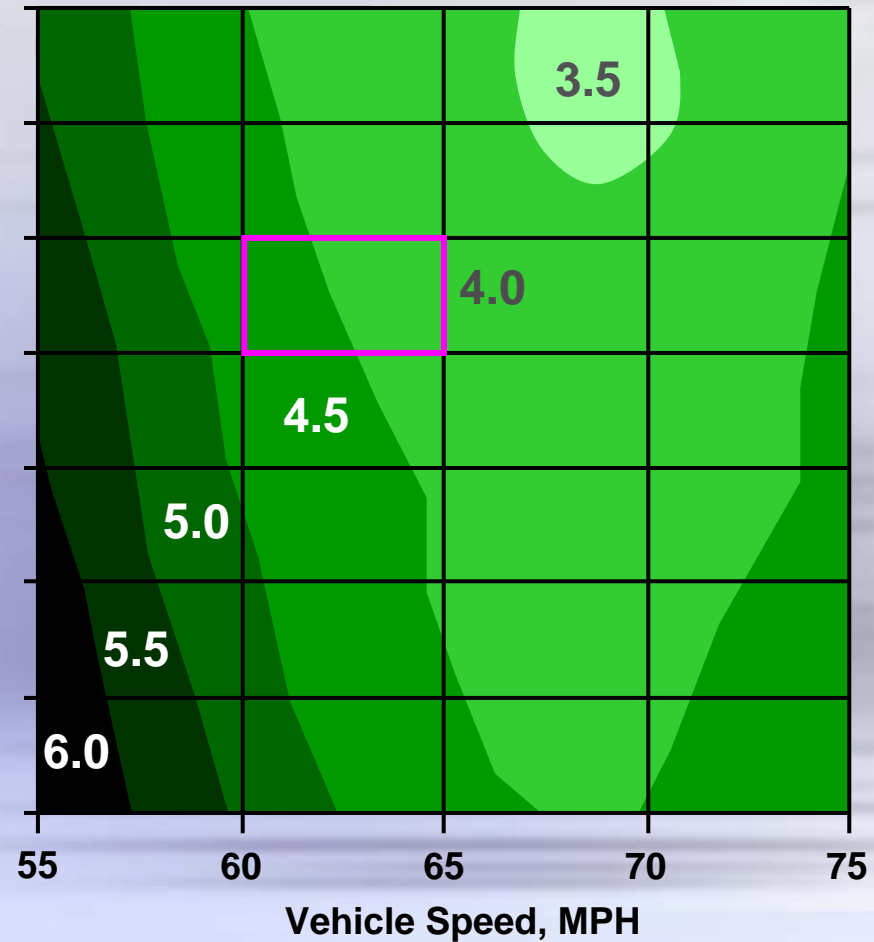
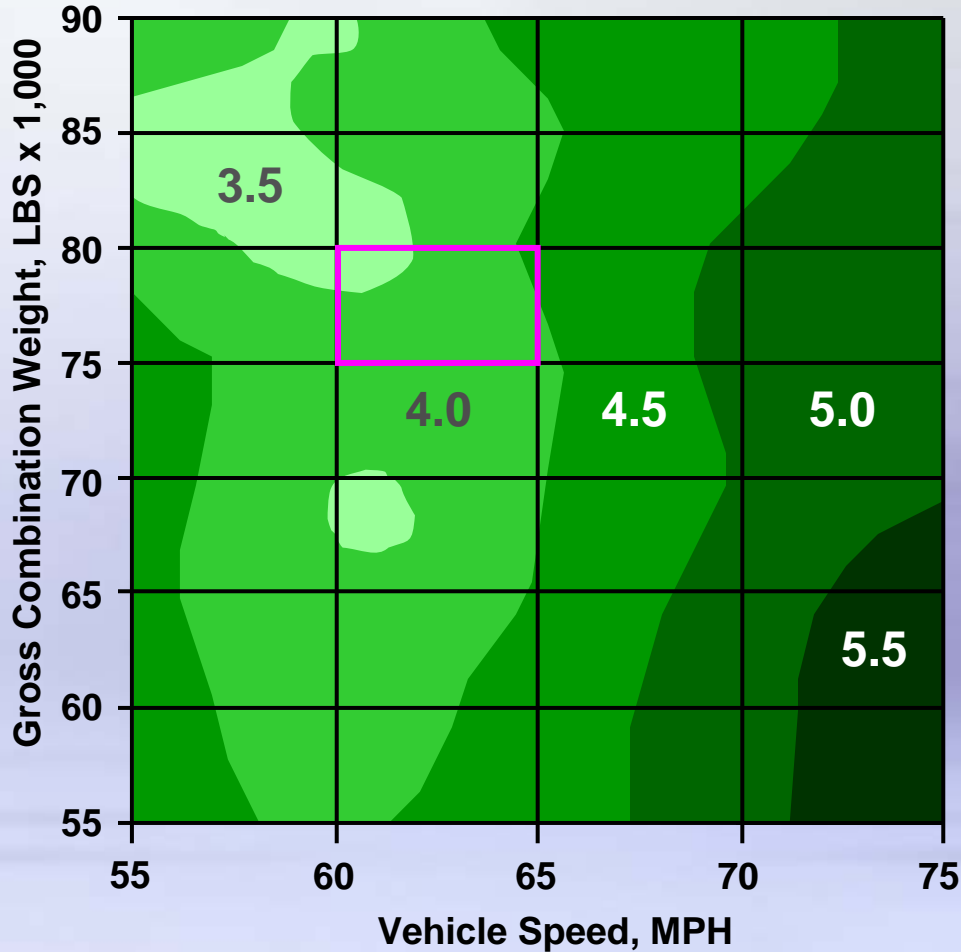
2010 Fuel Economy

In 2010, Detroit Diesel engines will go 45-90 hours between regenerations.



DDC fuel economy position (2010)

Expected improvement in OVERALL fuel economy of 2010 products over comparable 2007.



Demand Economy

Truck Load Carriers can expect up to 5% better diesel fuel consumption in 2010. Customer's diesel fuel savings will be impacted by the consumption of DEF.

Potential Savings (\$) over 5 years

		Price of Diesel Fuel, \$					
		2.25	2.50	2.75	3.00	3.25	3.50
Price of DEF, \$	2.00	6,715	7,905	9,095	10,285	11,475	12,665
	2.50	5,715	6,905	8,095	9,285	10,475	11,665
	3.00	4,715	5,905	7,095	8,285	9,475	10,665
	3.50	3,715	4,905	6,095	7,285	8,475	9,665
	4.00	2,715	3,905	5,095	6,285	7,475	8,665
	4.50	1,715	2,905	4,095	5,285	6,475	7,665
	5.00	715	1,905	3,095	4,285	3,475	6,665

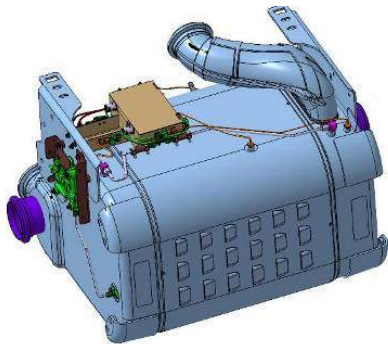
Savings based on: 120K miles/yr, 6.0 mpg '07 fuel economy, 300 mpg DEF consumption

Demand Simplicity

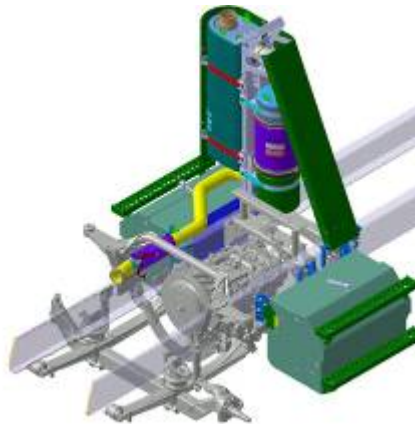
Demand Simplicity

Detroit Diesel offers 3 packaging options to suit your customers' varying needs. Offering more packaging options reduces the impact of adding new hardware for EPA 2010.

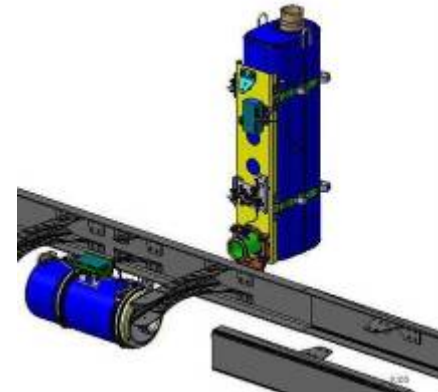
1-BOX™



2-Box Vertical



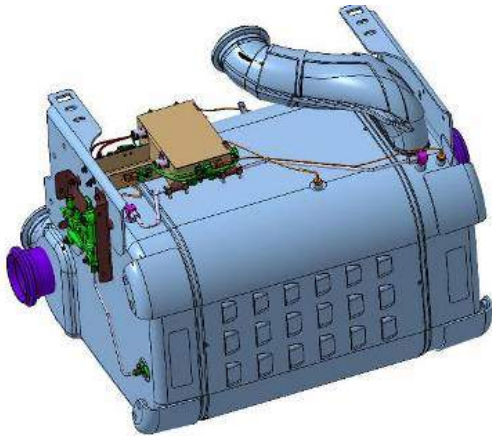
2-Box Vert/Horiz



Demand Simplicity

Detroit Diesel's proprietary 1-Box system offers multiple advantages to your customers. The system was designed for optimal packaging and to lower back pressure improving fuel economy over the 2-Box configurations.

1-BOX™



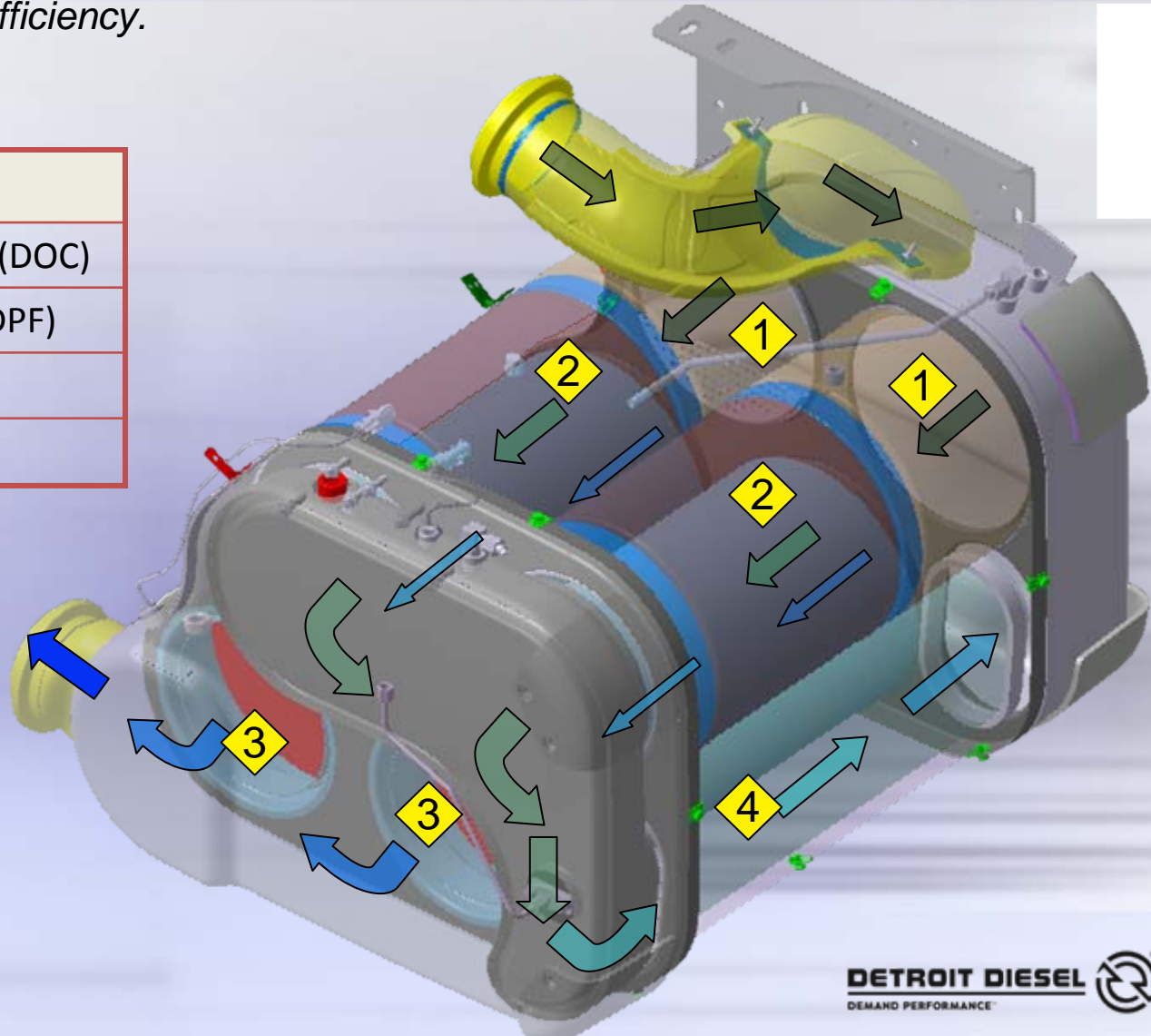
Advantages

- Combines DOC, DPF, DEF doser, SCR catalyst in ONE simple package
- Better fuel economy from lower back pressure
- No other 1-Box on the market

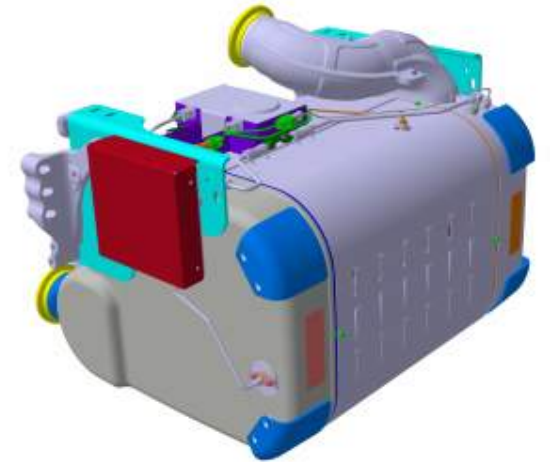
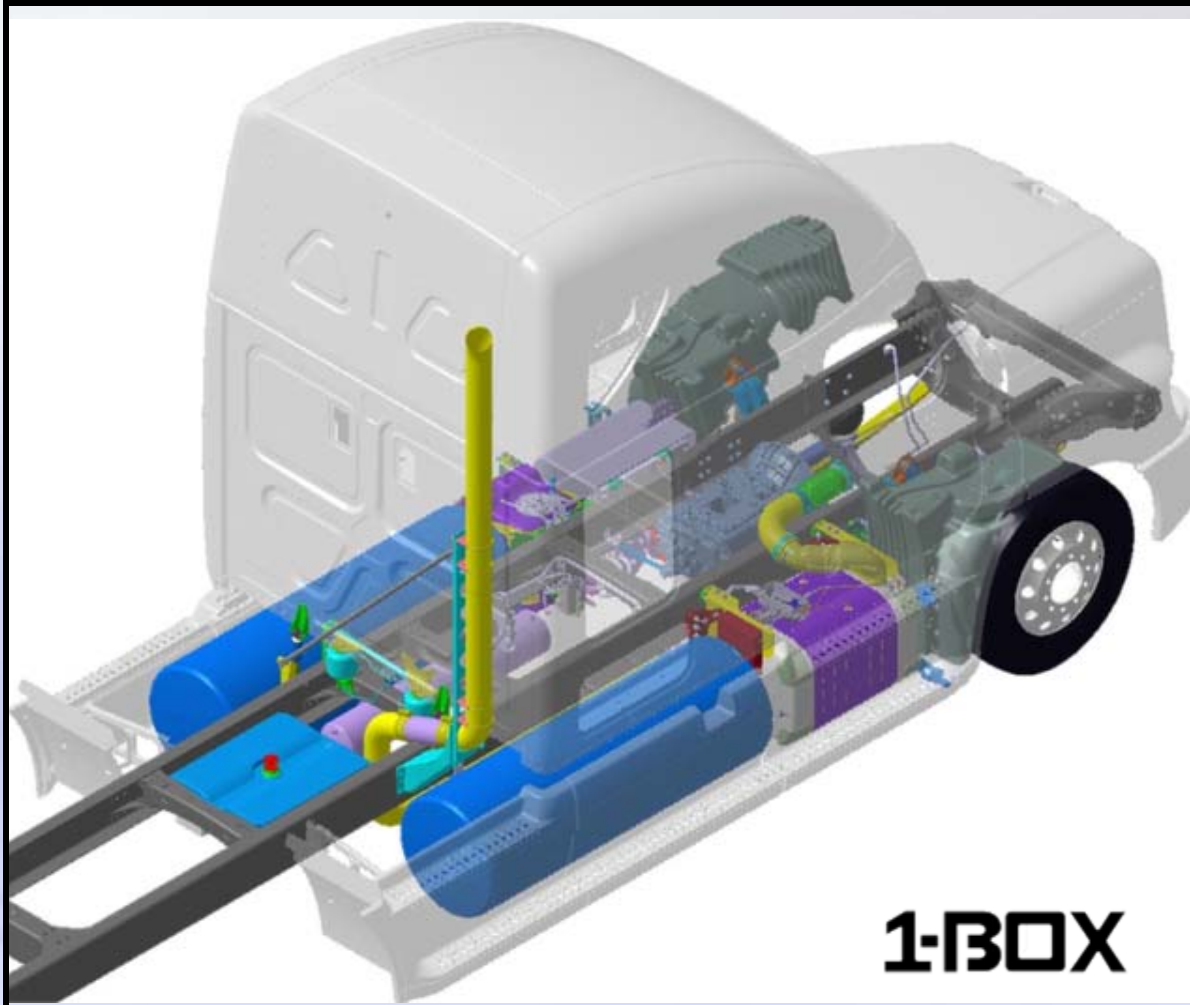
1-Box Flow

The following diagram illustrates the flow of exhaust through the DOC and DPF. Then where the DEF enters the hydrolysis pipe and eventually meets the exhaust in the SCR device. Detroit Diesel's dual parallel flow (ATD & SCR catalyst) reduces backpressure on the engine thus increasing fuel efficiency.

Item	Component
1	Diesel Oxidation Catalyst (DOC)
2	Diesel Particulate Filter (DPF)
3	SCR Devices
4	DEF Hydrolysis Pipe



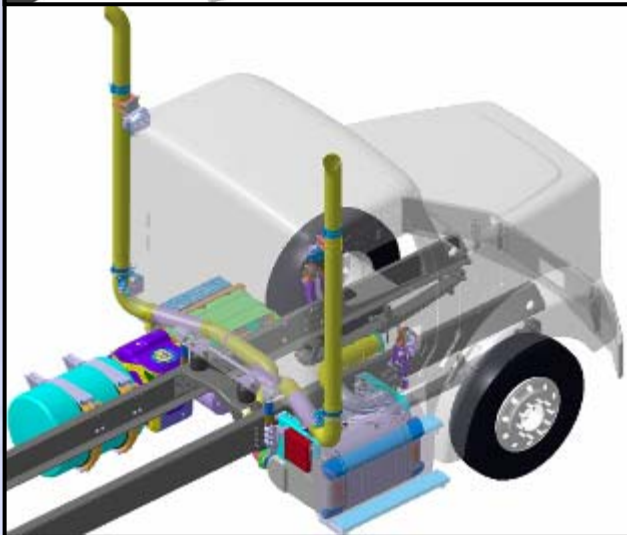
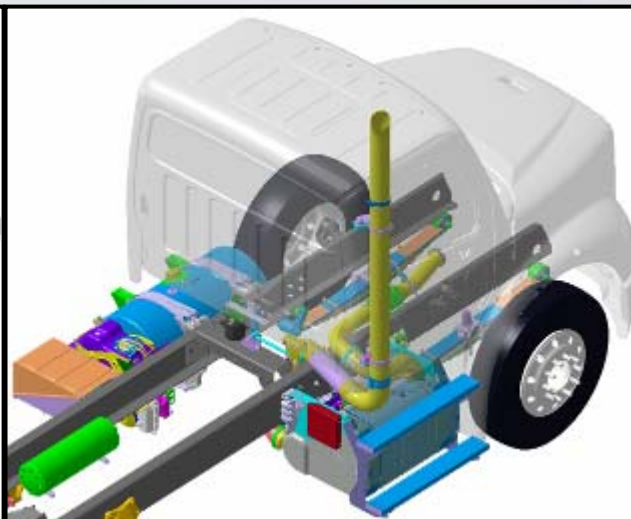
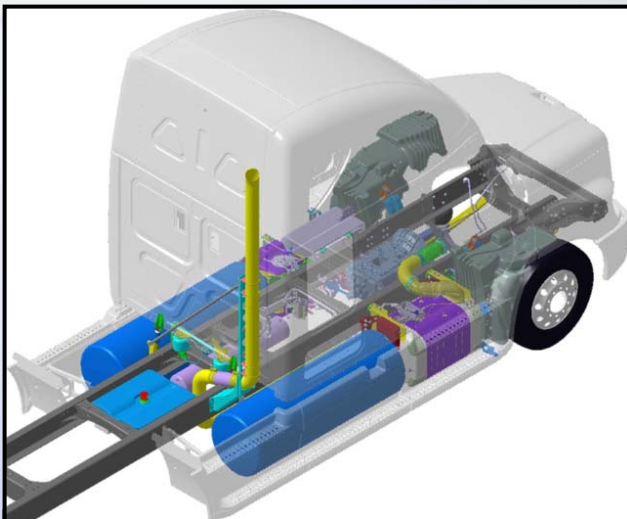
RH Understep Systems – DD13/15/16



- Compact/integrated design
- Highest fuel efficiency due to low system back pressure
- Clear BOC solution
- Lowest weight HD ATS
- Multiple tailpipe offerings
- Only dual tailpipe option
- Clear RH PTO solution

Tailpipe configurations...

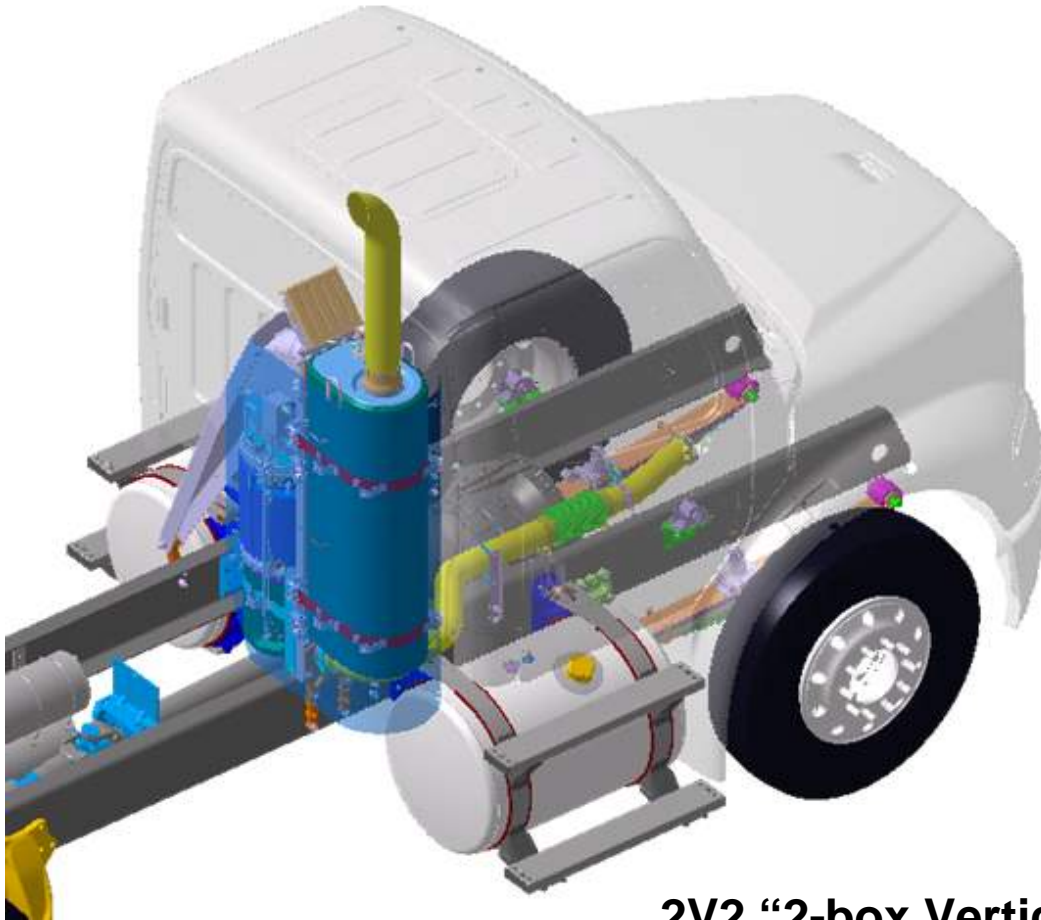
1-BOX



Tailpipe Configurations:

- Horiz – Straight
- Horiz – RH turnout
- Horiz – LH turnout
- RH frame mtd (CAS)
- LH frame mtd (CAS)
- Dual vertical frame mtd (24U Classic)
- RH B/C-pillar mtd (M2-112 & 24U Classic)
- LH B/C-pillar mtd (M2-112 & 24U Classic)
- Dual B-pillar mtd (24U Classic)

Vertical ATS System (2V2) – DD13/DD15

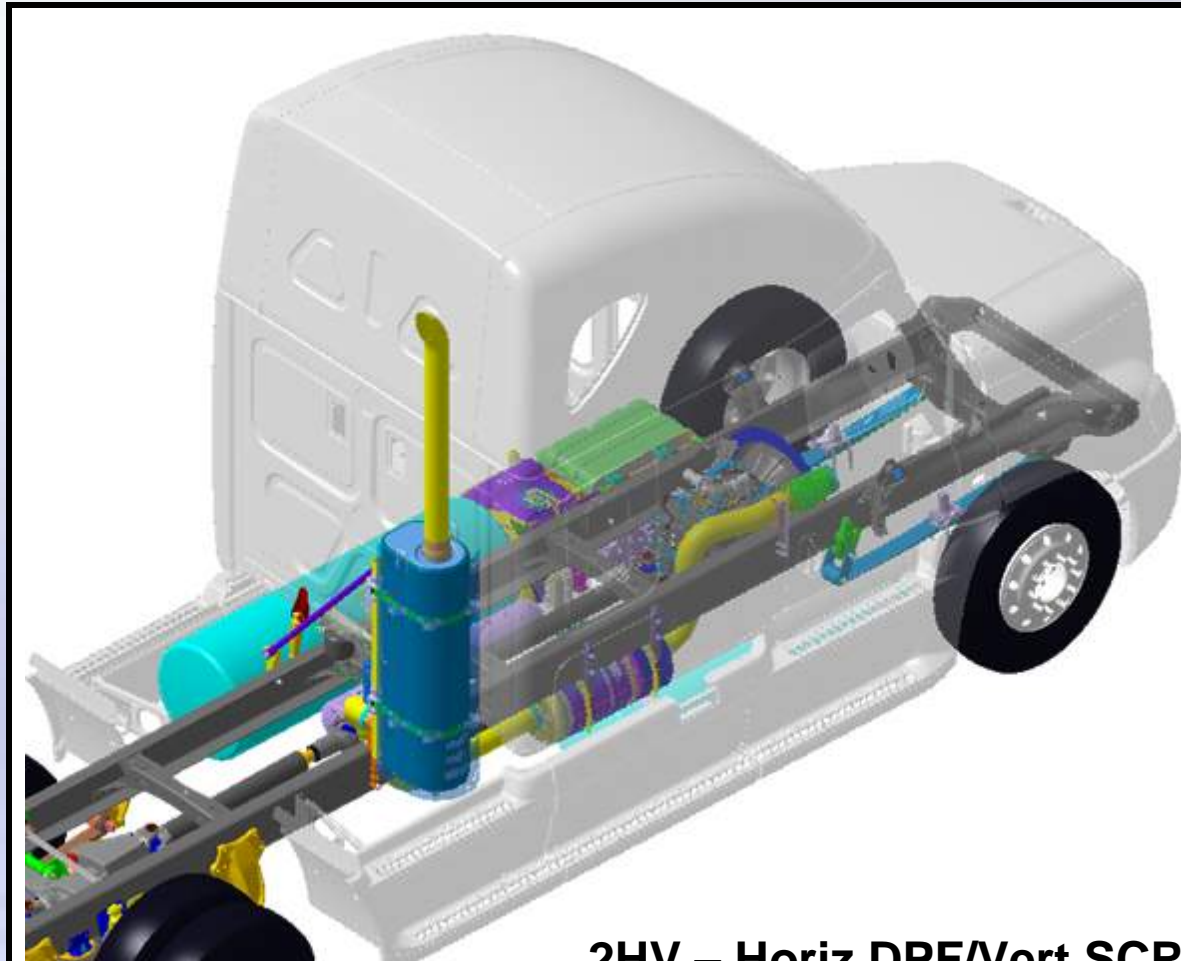


2V2 “2-box Vertical”

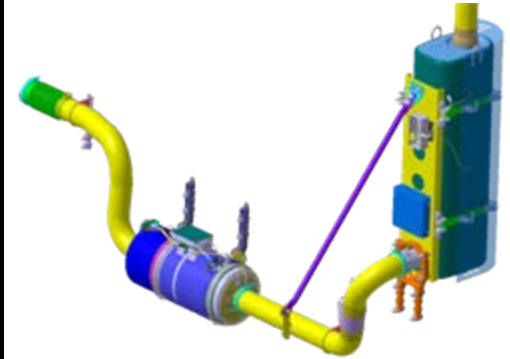


- Clear “below frame” solution
- High fuel capacity
- Clear PTO
- Similar BOC protrusion to EPA '07 vertical DPF
- Available on daycabs
- LH & RH mtg available

Horizontal/Vertical ATS System (2HV)– DD13/DD15



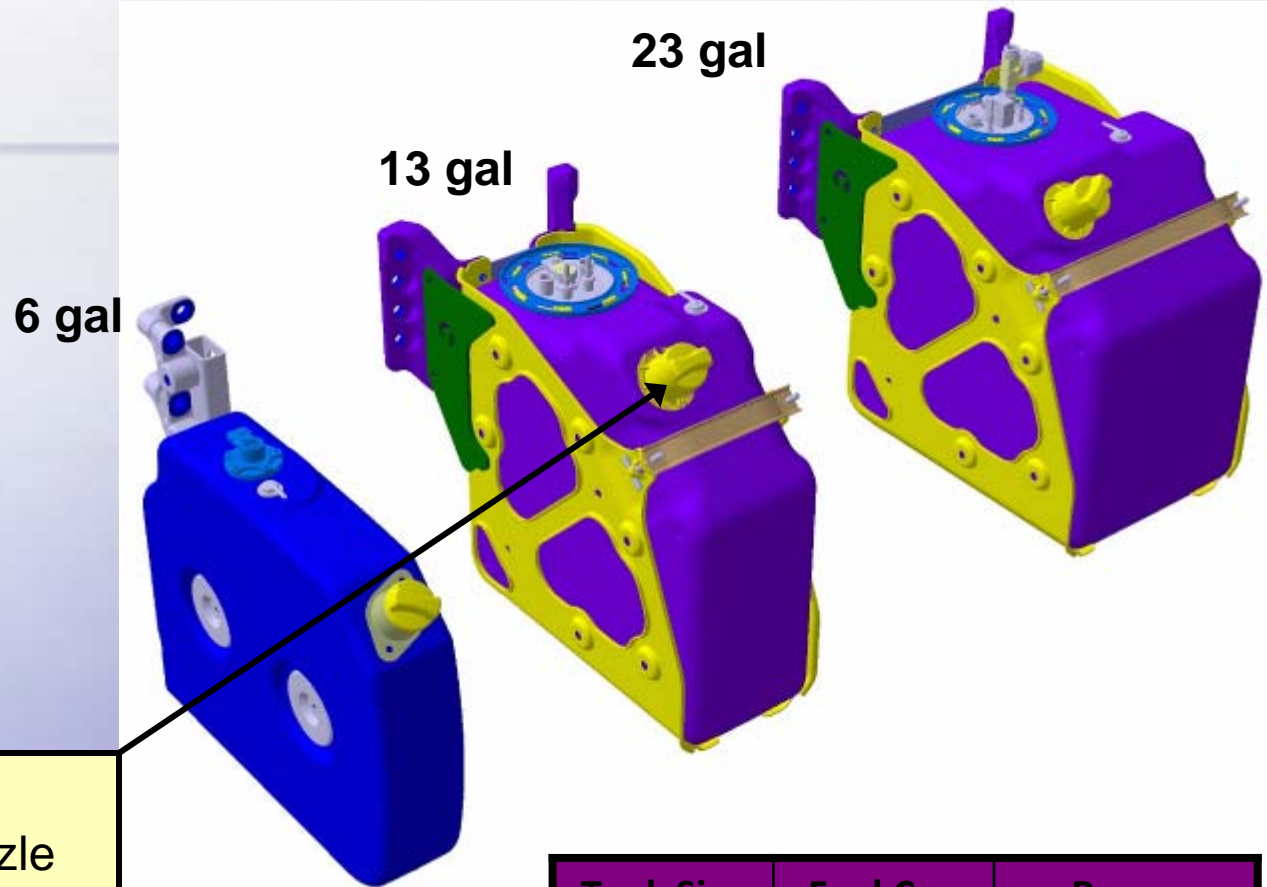
2HV – Horiz DPF/Vert SCR



- High fuel capacity
- Similar BOC protrusion to EPA '07 vertical DPF
- Available on 48"+ sleeper cabs



DEF Tanks



Fill necks do not allow insertion of diesel nozzle into DEF tank (magnetic lock option being developed)

Cold Weather Operation:

- Tanks are engine coolant heated
- DEF delivery lines are electrically heated

Tank Size	Fuel Cap	Range (miles)
6 gal	100 gal	1,800
13 gal	200 gal	3,900
23 gal	300+ gal	6,900

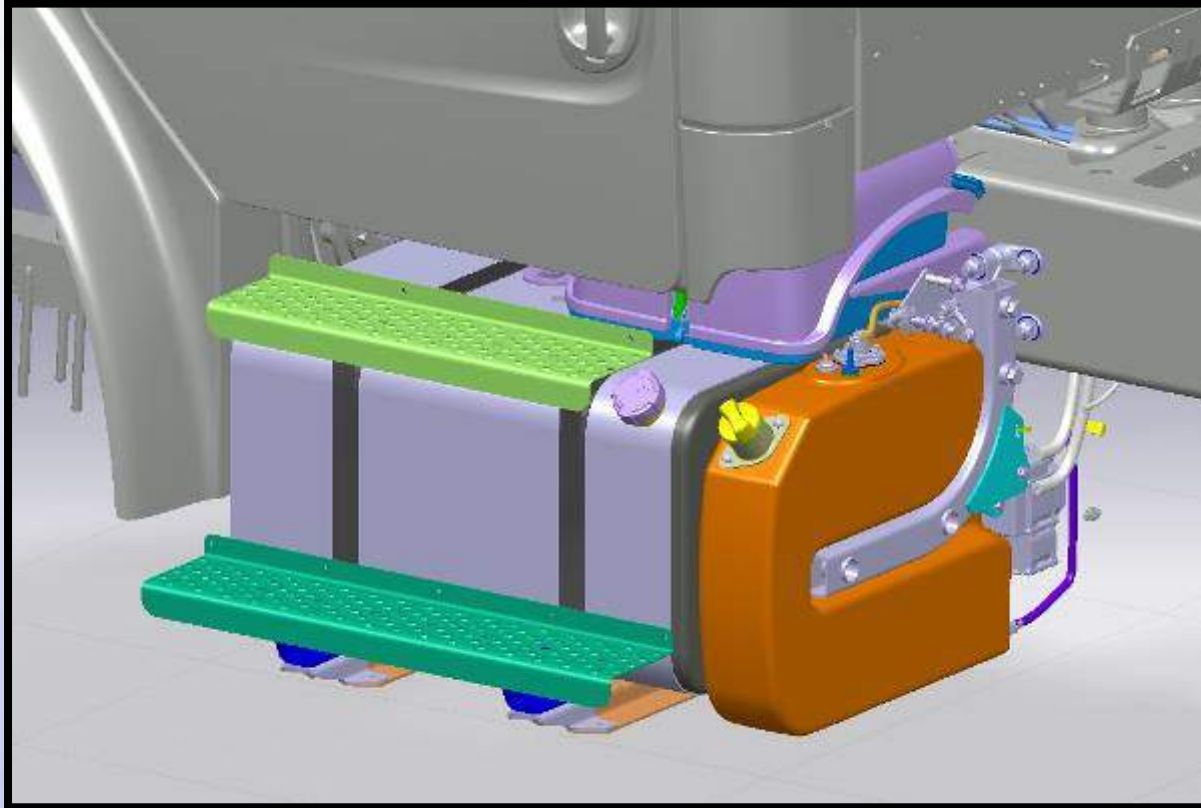
DEF tank & battery box locations



- DEF tanks located only on left side of vehicle
- Standard DEF tank location is aft of battery box
- Optional DEF tank location forward of fuel tank for daycabs
- Filler neck behind battery access panel for Cascadia with side fairings
- Beauty covers (diamond plate) available for urea tanks and battery boxes.



DEF Tanks

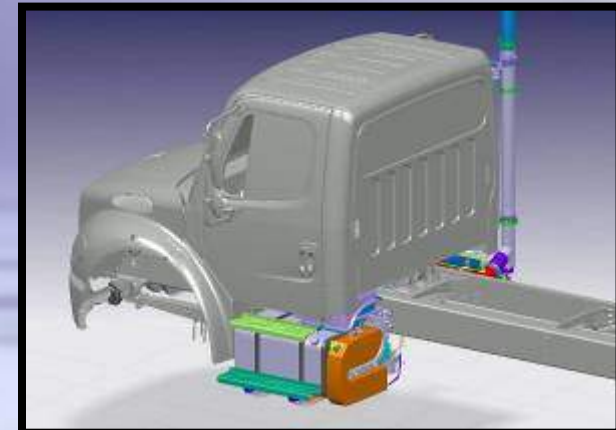


Clear Back of Cab Solution:

- 6 gal DEF tank
- 50 gallon fuel tank
- RH understep ATS

M2 106:




- DEF tank located aft of rectangular fuel tanks
- All DEF tank sizes available






Vehicle Impact - Weight

Like all EPA 2010 emissions systems, BlueTec will add weight to the vehicle. All weights are incremental over the 2007 system with full DEF tanks. Customers can purchase 2010 engines using their current specifications...

13 Gallon DEF Tank

Engine	1-BOX (lbs)	2-Box Vertical (lbs)	2-Box Vert/Horiz (lbs)
 DD13	418	546	546
 DD15	446	546	546
 DD16	446	Not available	Not available

23 Gallon DEF Tank

Engine	1-BOX (lbs)	2-Box Vertical (lbs)	2-Box Vert/Horiz (lbs)
 DD13	535	663	663
 DD15	563	663	663
 DD16	563	Not available	Not available

Demand Simplicity

EPA 07 service intervals are planned to stay the same for the Detroit Diesel engine platform. New components added for EPA 2010 will need to be serviced with the following schedules.

Maintenance Item	Duration / Capacity
Oil and Filter	Same as EPA 07
Fuel Filter	
Valve Adjustment	
Crankcase Breather	
Diesel Particulate Filter	
Coolant Filter	Eliminated from EPA 2010 model
New Maintenance for EPA 2010	
DEF Filter	Every 2 years
Bladder Fill	

Note: Data subject to change

Demand Simplicity

Keeping your DEF tank full is no big deal. All you have to do is watch your DEF gauge and fill the tank when the gauge gets low. It's that simple.



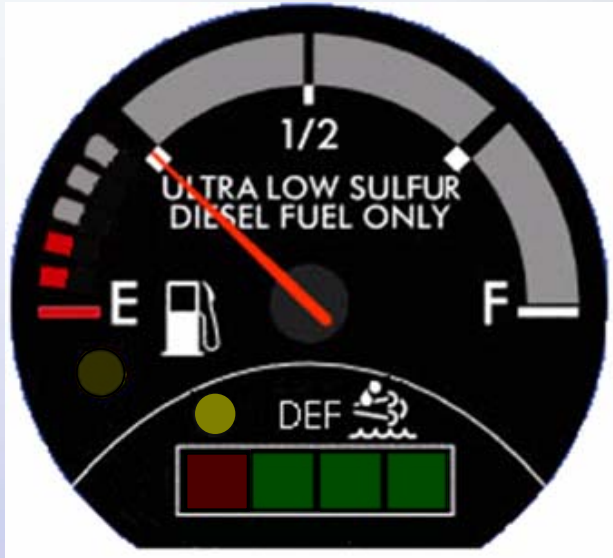
When this gauge is low...



...fill your DEF tank

2010 Driver Inducements

In addition to the BlueTec hardware is a new DEF gauge. Just like filling up their diesel tank, drivers will need to remember to watch their DEF gauge and fill it when needed.



FULL	DEF Level	Gauge Lamps	DEF Lamp
	75% to 100%	4 green lights	off
	50% to 75%	3 green lights	off
	25% to 50%	2 green lights	off
	10% to 25%	1 green light	off
	5% to 10%	1 yellow light	on solid
	0% to 5%	1 red light flashing	on flashing

EMPTY

Check Engine Lamp

- 25% Engine Derate
- 55 MPH Vehicle Speed Limit

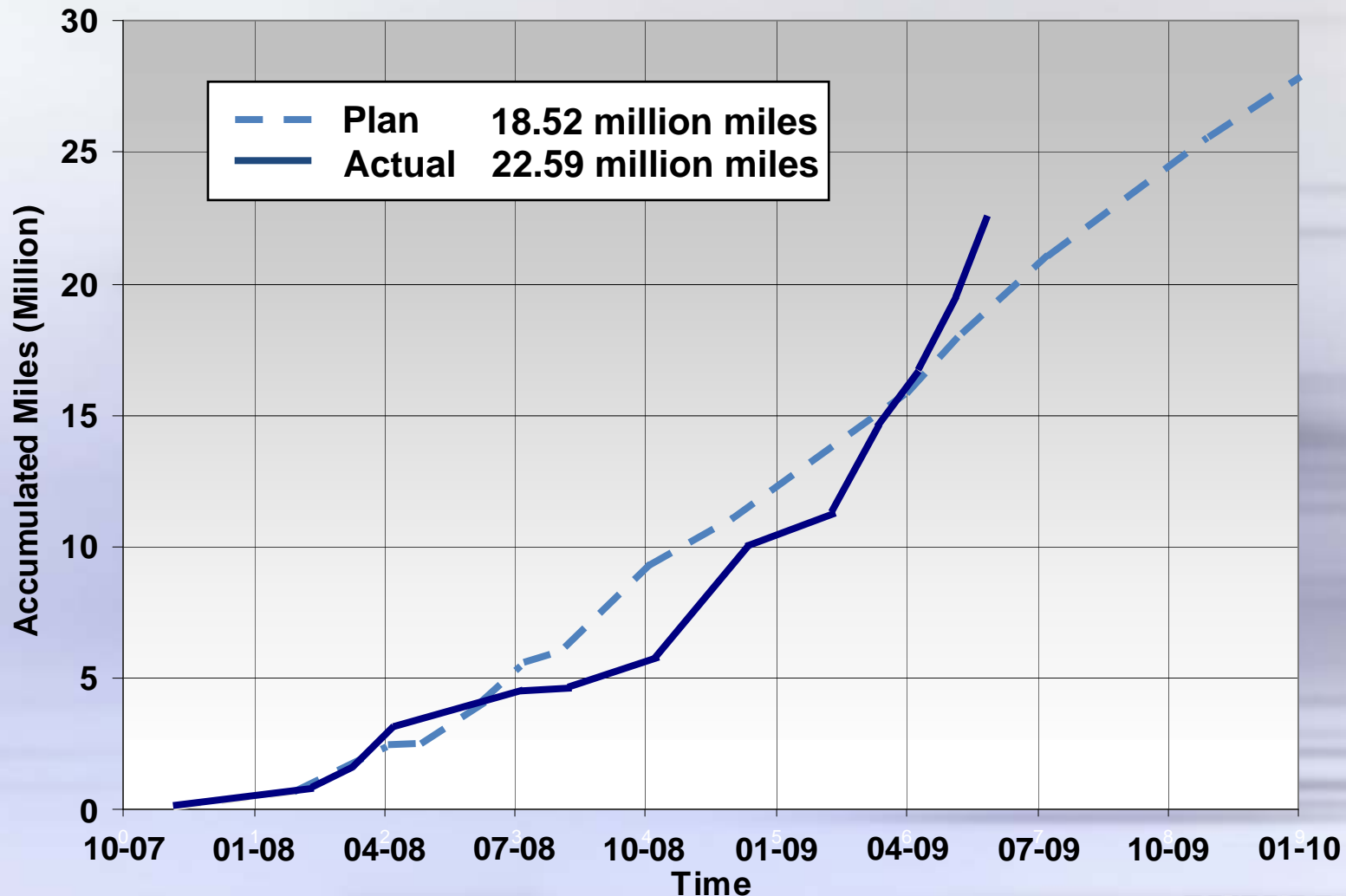
Malfunction Indicator Lamp (MIL)



Demand Experience

Demand Experience

The BlueTec emissions system exceeds planned test mileage to date, on its way to over 27 million miles by start of production.



Demand Experience

- Many of the world's leading engine manufacturing companies use SCR
- BlueTec is already in use all over the world






- Daimler has over 200,000 BlueTec units on the road today
- Detroit Diesel has over 15 MILLION miles and counting of BlueTec validation testing in North America alone

Advantages Detroit Diesel Engines

An Engine to Suit Your Needs

The Detroit Diesel engine platform gives customers choice. With horsepower stretching from 350 – 600 and torque from 1250 to 2050 the engine platform is design to cover the varying powertrain needs of customers.

Attribute ⁽¹⁾			
Target Market	LTL, Reg. Dist., Vocational	Truck Load	Specialized Hauling, O/O, Vocational
Displacement	12.8	14.8	15.6
HP Range	350 – 450	455 – 560	475 – 600
Torque Range	1250 – 1650	1550 – 1850	1750 – 2050

(1) EPA 2010 specification



Proven Platform

While other engines manufacturers are making changes to their engine architecture, the Detroit Diesel DD15 has gained real-world experience from EPA 07 and will have virtually no required changes to be 2010 compliant.

Year	Units Factory Sold	Miles of Customer Experience
DD15	16,050	1.5 Billion

Proven Platform

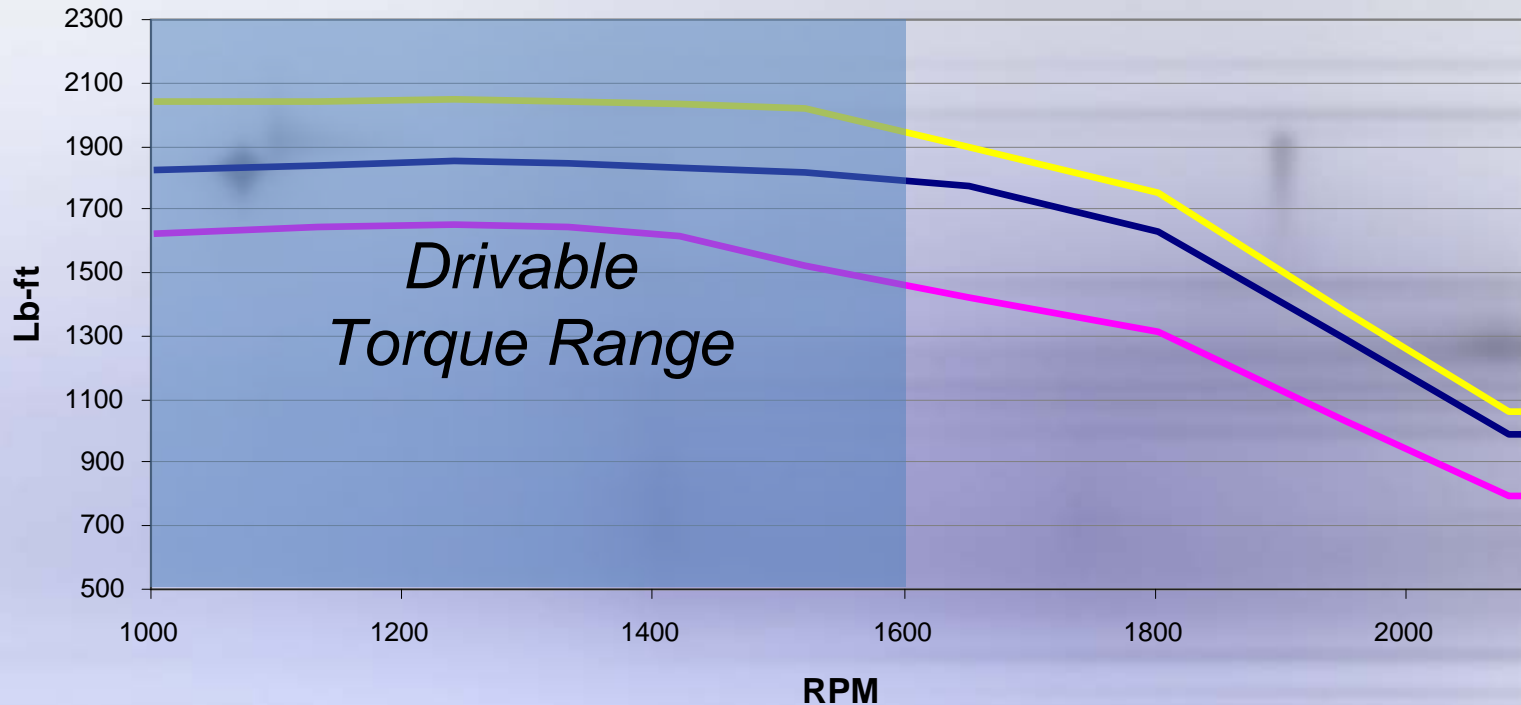
With virtually no required changes to our engines to meet EPA 2010 regulations, Detroit Diesel effectively introduced its EPA 2010 engines with the introduction of its EPA 2007 models.

Component	Design Changes in 2010
Fuel system	No major design changes to these components to meet EPA 2010 regulations
Camshaft	
Turbo	
Turbo compound	
Pistons / Rods	
Crankshaft	
Block / Head	
EGR Cooler	
Water Pump	
Oil / Coolant System	

Demand Torque Range

The DD13, DD15 and DD16 torque curves are impressive. Long and flat for a 600 RPM band that pulls strong down to 1000 RPM means more time in top gear.

EPA 2010 DD13, DD15, DD16 Torque Curves






— DD15 560 bhp / 1850 lb-ft — DD13 450 bhp / 1650 lb-ft — DD16 600 bhp / 2050 lb-ft






Demand Durability

Having an engine that has great power and fuel economy is only good if it is able to last the test of time. So the Detroit Diesel engine platform was designed with a B-50 life to exceed 1,000,000 miles.

Engine	B-50 Life (miles)
 DD13	1,000,000
 DD15	1,200,000
 DD16	1,200,000

Engine Model Matrix

In 2010 Detroit Diesel will offer its full line-up of engine displacements 13L, 15L, 16L.

Chassis			
Cascadia 113	Jan		
Cascadia 125	Mar	Jan	May
Coronado 122SFA		Jan	May
Coronado 122SBA	Mar	Jan	May
Coronado 132SFA		Mar	May
M2 112	Mar		
M2 112V	Mar		

Questions?

Thank you
For your Time!

TODAY'S BEST PERFORMING ENGINES TOMORROW'S PROVEN 2010 SOLUTION



Introducing Detroit Diesel's BlueTec[®] SCR emissions technology. Designed from the ground up to work seamlessly with the DD13[™], DD15[™] and DD16[™] engines, BlueTec is the most simple and fuel efficient option for 2010 emissions requirements. With 25 million test miles in North America, BlueTec[®] SCR is more than reliable, it's proven. Learn more at DetroitDiesel.com.



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