

**AC and RT
Cranes**



Crawler Cranes



Construction



AWP



**Material
Handling and
Port Solutions**

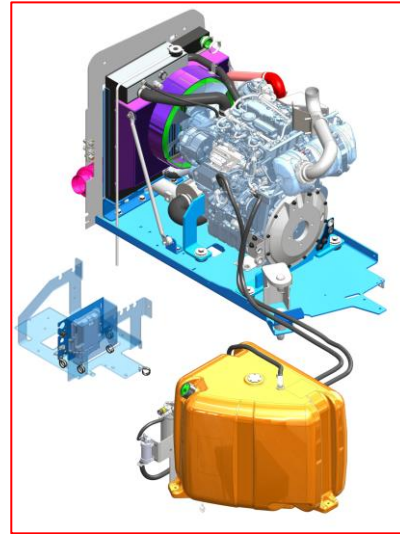
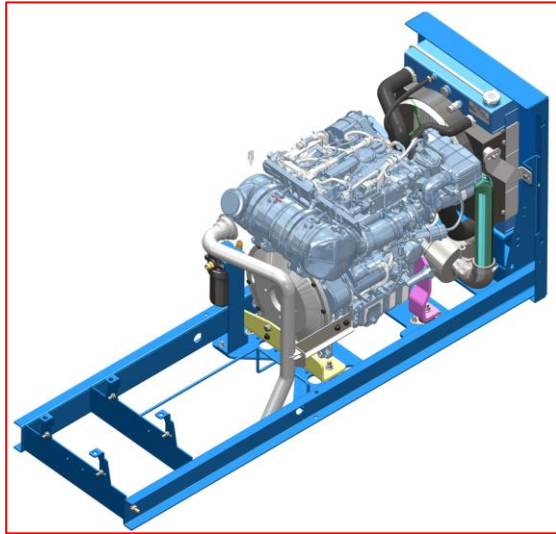


**Material
Processing**



Engine Emission Management

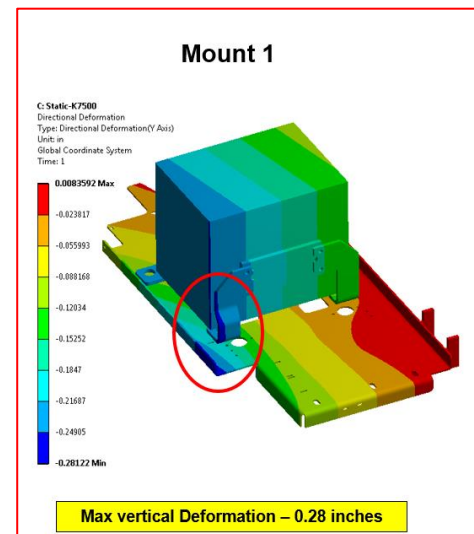
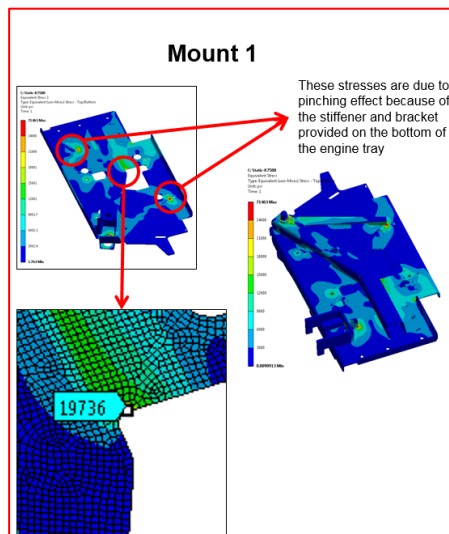
- Expertise in Tier-4F, EM4 & EM5 Implementation of Cummins, Volvo, Scania, Deutz and MTU Engines with upgraded versions
- Designing of New Air Intake system, CAC Group, Engine Coolant Group, Exhaust System, Fuel tank Group, Ad Blue tank Group and Engine & Transmission mounts as per Engine manufacturer installation guidelines
- Structural Modification on the Chassis and Decking to accommodate new Engines changes
- Electrical Schematics & Harness Design
- Hydraulics Hoses and Tubes Routing
- Vibration Analysis on Engine Mounts
- Testing and prototype build support

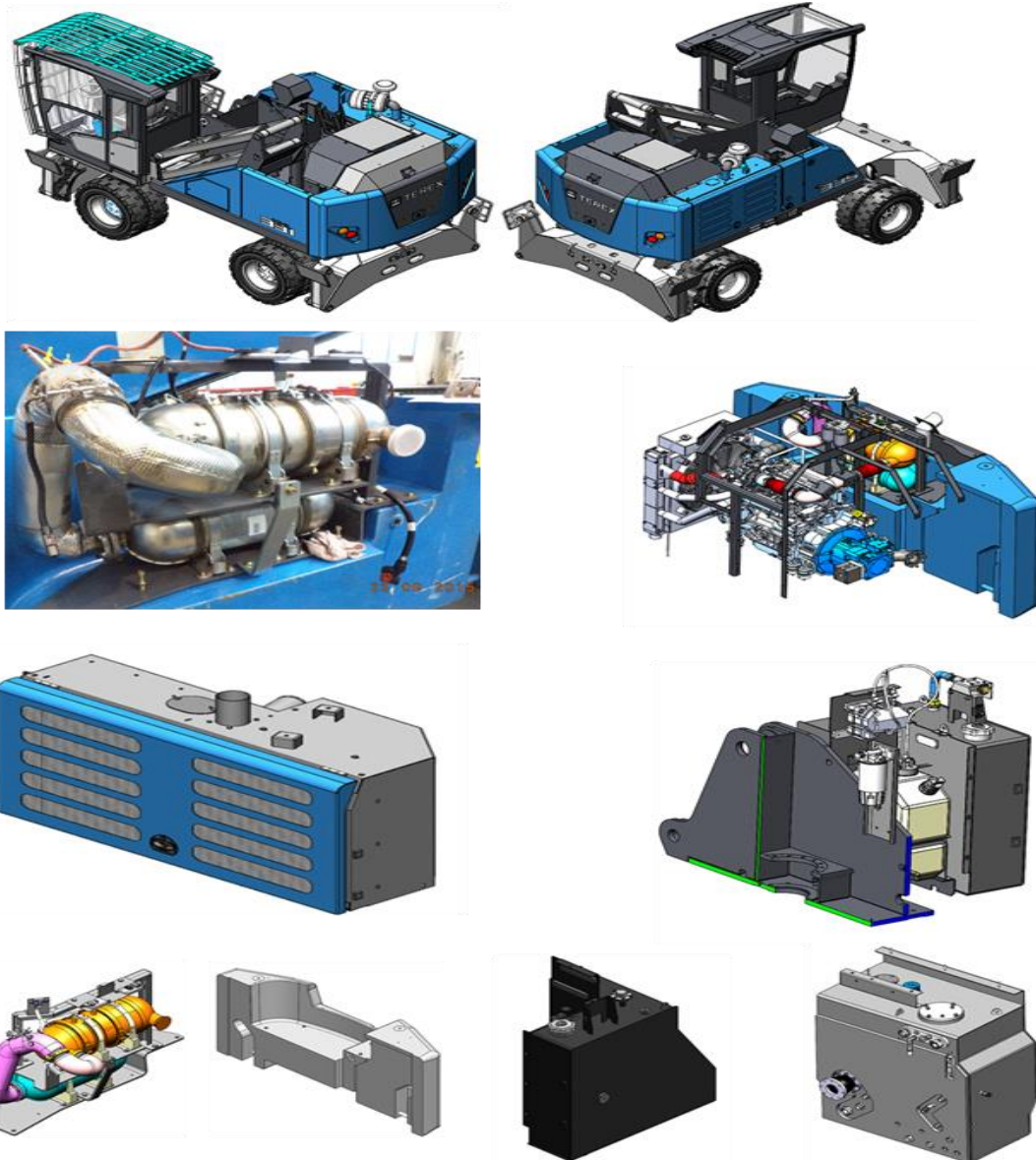


Stage V & Tier 4F Engine Integration for MEWP

Scope: Integration of Stage V & Tier 4F engines into existing 13 machines of Mobile Elevating work Platforms

- Impact study of integrating the Stage V & Tier 4F engines in Various Machines.
- Design of Engine mounts, cooling system mounts, radiator stabilizers, ducting for air intake, cooling & exhaust after treatment systems.
- Identification of the coolant level in expansion tank at different gradients.
- Vibration analysis to evaluate damping effect of two different Vibration isolators and selection of best alternative.
- Carried out Finite element analysis for engine trays to optimize.
- Positive shut-off valve integration
- common parts across 8 models which uses 74HP engine & across 7 models which uses 49HP engines.
- Use the existing engine tray with minimum changes to the weldment.
- Creation of electrical harness drawings and Routing of fuel lines
- BOM cost analysis / BOM waterfall



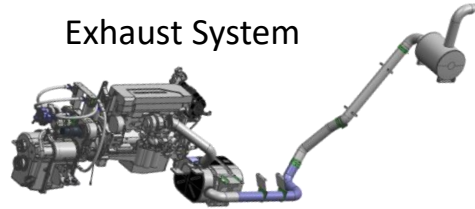


Tier 4 Final Implementation for Material Handling Machines

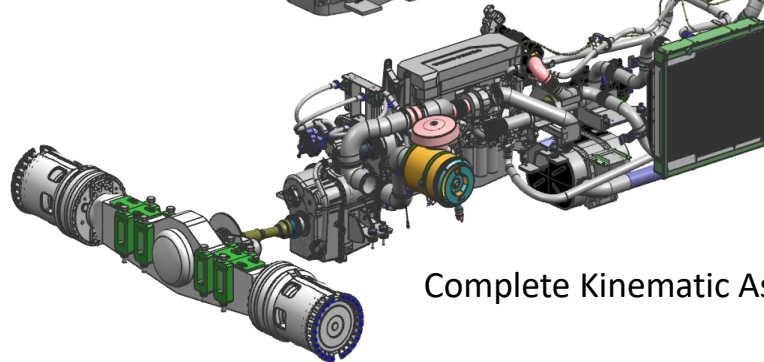
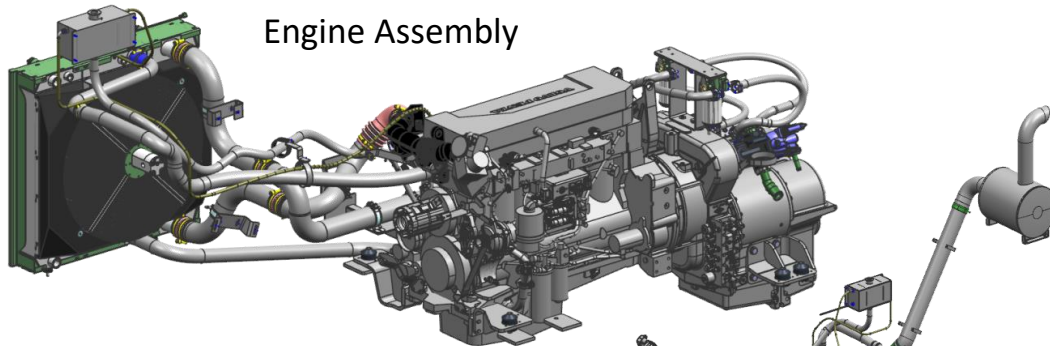
Scope: Tier 4 Final Engine Integration

- Build the machine layout as per the Deutz engine guidelines.
- Integrate the systems effectively with reference machine.
- Implement the New cabin with reference to other machines.
- Release the standard production drawings for procurements.
- Subsystem Redesign & Integration
- Deutz FT4 Engine integration, Exhaust After Treatment Integration, Exhaust system, Counterweight design, Urea tank integration.
- New cabin implementation

Exhaust System



Engine Assembly



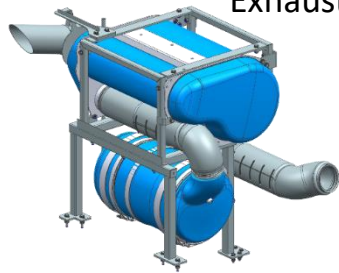
Complete Kinematic Assembly

Tier 4 Final Implementation for TFC 45/TFC 46 Reach Stackers

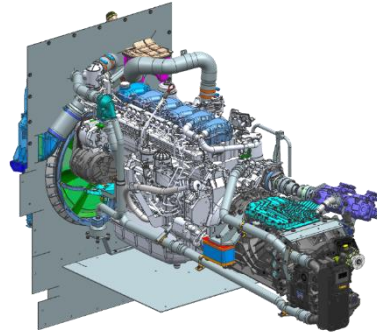
Scope: Engine Emission Upgrade from Tier 4i to Tier 4 Final for SCANIA, Volvo and Cummins Engines

- New Exhaust line Design to comply Cummins T4F Recommendation
- New Air intake line Design to comply Cummins T4F Recommendation
- New Kinematic Assembly for Chassis length of 6,2 m
- New Engine and Gearbox Mounting Bracket s Design to align the axis of chassis and engine.
- New CAC line Design for easy assembly.
- New Engine coolant line Design.
- Design modification for Fuel Tank Group
- Design updates for Ad Blue Group

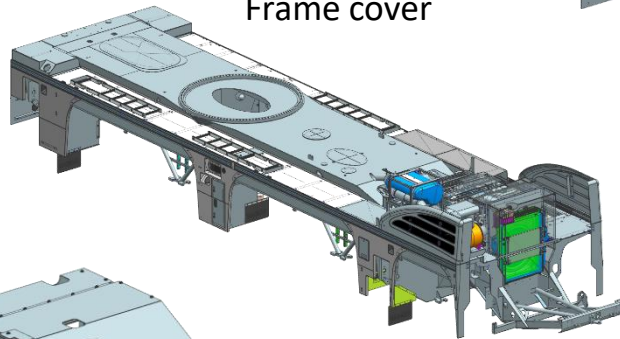
Exhaust System



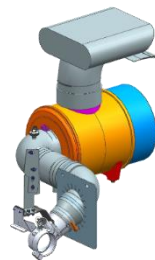
Engine Assembly



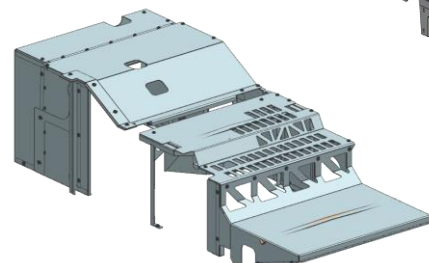
Carrier Frame with
Frame cover



Air Filter System



Engine Enclosure



EM5 Implementation for All Terrain Cranes 130T – 300T

Scope: Engine Emission Upgrade from EM4 to EM5

- Design of Exhaust System.
- Design of Cooling system.
- Design of Pump Mounting Brackets.
- Design of Transmission Mounts.
- Design of Air Intake Assembly
- Design of CAC Assembly
- Design of Engine Covering Assembly
- Design changes in Chassis to make common chassis for EM3a/EM4/EM5
- Design modification for Fuel Tank Group
- Design updates for Ad Blue Group