

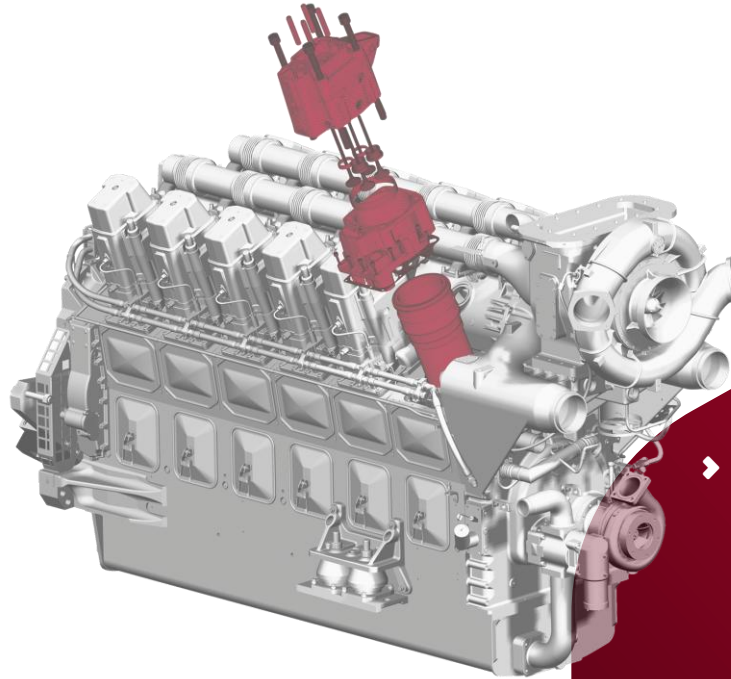
Virtual Development of Large Bore Engines

FEV SIGNATURE SOLUTIONS

We design or support development of your large bore ICE, optimized for any fuel and application

FEV offers

- ▶ Layout and optimization simulation for all relevant functional components, subassemblies and modules to achieve engine durability, vibration targets as well as requirements for power, low fuel consumption and emissions.
- ▶ In-house state of the art simulation tool chain including Fluid CFD, Structural FEA, Dynamic multi-body simulations and Global Dynamics (NVH).
- ▶ Approach applicable for new engine developments, prototypes or for engines in production including adaptations to new low carbon fuels and new engine applications.
- ▶ Large and experienced team of dedicated experts for all aspects of engine development, as well as a parallel scheduling process enabling us to quickly complete projects.



Why FEV

- ▶ 45+ years of engineering excellence, trusted by global OEMs and Tier-X suppliers with proven methodology applied to various large engine developments and continuously improved throughout 30+ years
- ▶ Complete lifecycle support: From concept to series maturity, including design, simulation, prototyping, testing, industrialization, and implementation
- ▶ Customer-centric solutions: Transparent and customizable, enabling you to extend, integrate, and scale your development

Reference projects

MECHANICAL CAE
FOR
LARGE BORE ENGINES



**V20, V16, V12 and
V8 high speed
engines**

(Engine family
development)



**V16 medium speed
engine**

(Engine family extension)



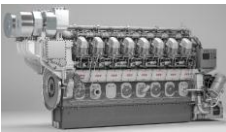
**V20 medium speed
engine**

(Engine family
development)



**V16 high speed
engine**

(Engine family
development)



**V20 medium speed
engine**

(Engine upgrade)



**V20, V16 and V12
high speed
engines**

(Engine family
development)



**V20, V16 and V12
high speed
engines**

(Engine family
development)



**V20 high speed
engine**

(Engine family
development)



**V16 high speed
engine**

(Engine family extension)



Patents

**Crankshaft, combustion
engine and control device**

KONRAD BUCZEK et al.
DE102020007330B4 (granted),
CN114576001A (pending)

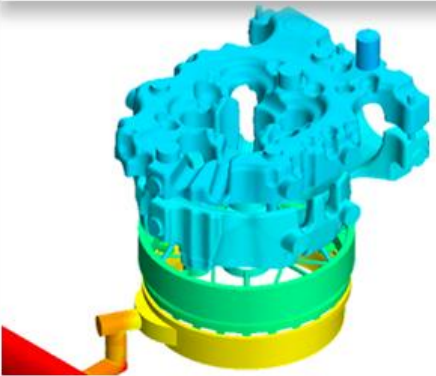
■ European OEM

■ Asian OEM

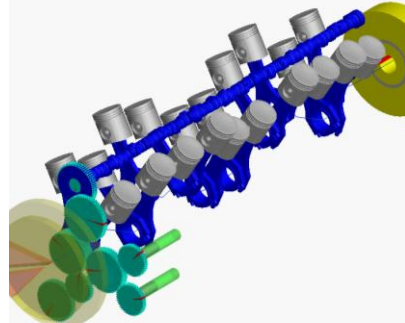
Our mechanical CAE approach for large bore engines

CORE FEATURES

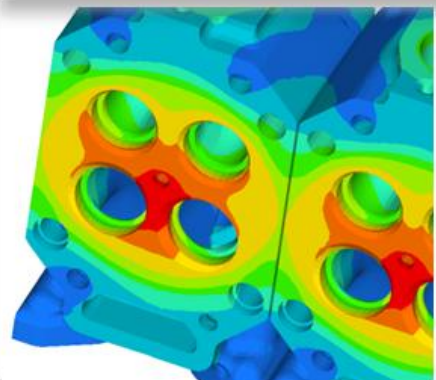
Fluid



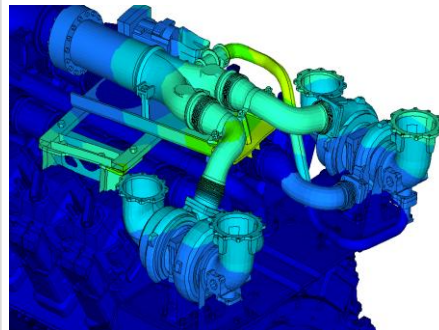
Dynamic



Structure



Engine Vibration



1D / 3D Fluid Coolant & Oil

Layout and Simulation of the Coolant and Lubrication Circuit by means of 1D-simulation as well as internal coolant flow distribution using 3D CFD

Advanced Dynamics

Layout and Simulation of Crank-Train, Valve-Train, timing- and accessory-drives by means of Vibration and Durability

Structural Analysis

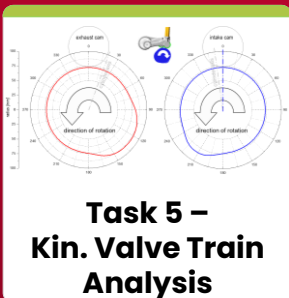
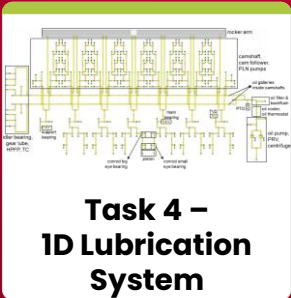
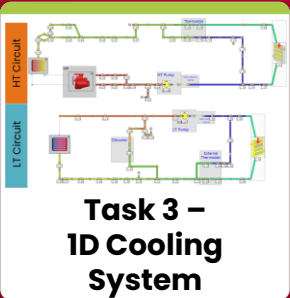
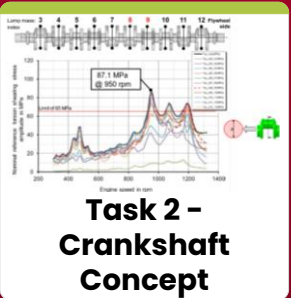
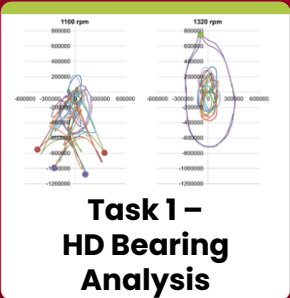
Finite-Element Analysis of all high loaded engine components with focus on temperatures, deformations and durability

Global Engine Vibrations (NVH)

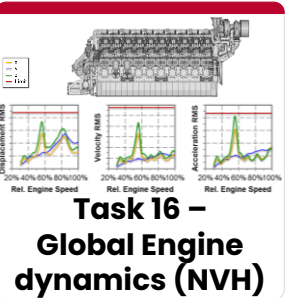
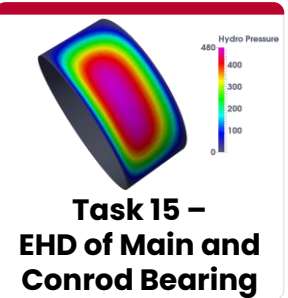
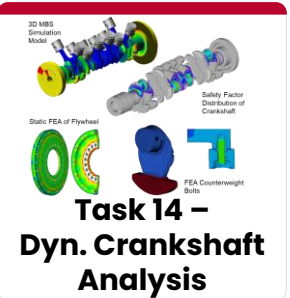
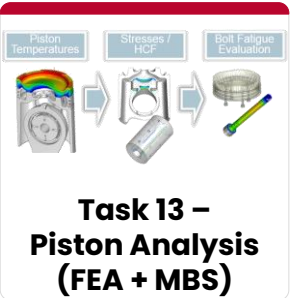
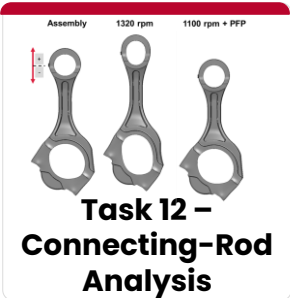
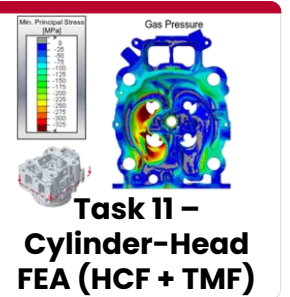
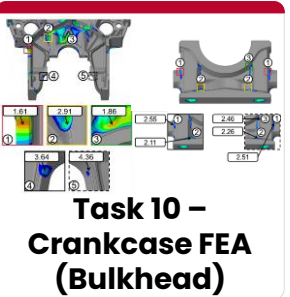
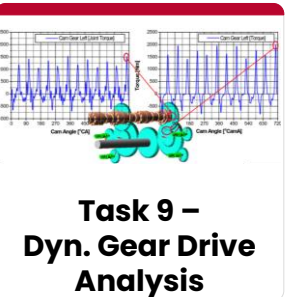
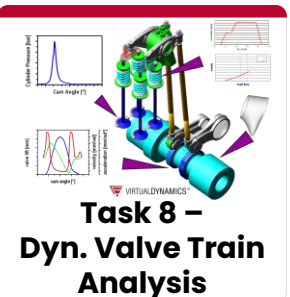
Determination of vibration amplitudes acc. to the requirements of the classification (DIN ISO 10816-6, ISO 8528-9, DNV etc.) as well as delivering input for the durability analysis

Our mechanical CAE approach covers the full spectrum of large bore engine development

■ Concept Phase



■ Layout Phase



Get in touch with us for further information



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signature-solutions](http://www.fev.com/en/signature-solutions)