



Full System Modelling of Parallel Shafts and Bearings

A RomaxDesigner model provides you with a virtual transmission with all the essential engineering attributes ready for you to analyse. It seamlessly brings analysis to the concept stage where decisions are made up front in the design cycle. The combination of an intuitive user interface and expert knowledge makes RomaxDesigner the choice for transmission modelling.

Summary of parallel shaft modelling capabilities:

- Unlimited range of transmission layouts and configurations for parallel shafts
- Full system flexibility and analysis for shaft, bearing and gear misalignments
- System-wide duty cycle analysis linked to all component ratings
- Gear design, rating and detailed load sharing analysis
- Bearing life calculations and advanced analytical methods
- Integration with RomaxNVH for gear rattle and whine analysis
- Flexible housing and shafts using FE models

“RomaxDesigner is without doubt a key system for us in the conceptualisation and development of transmission systems.”

Dr. Philipsenburg,
Head of Technical Engineering,
GETRAG Ford

“The Romax Technology design and product development software is, without question, the world’s leading power transmission design tool. This advanced software tool enables our engineers to provide outstanding modelling and analysis so we can create technically superior designs in short timeframes”

Craig Winn,
President, Applied Technology Inc.

RomaxDesigner’s Parallel Shaft Modelling is a comprehensive package for multi-shaft transmissions. It covers applications from the transportation and energy industries including: automotive, off-highway, aerospace and wind.

The durability and noise and vibration of a transmission system are particularly sensitive to system deflection and assembly variations, as well as other design parameters. The Parallel Shaft Modeller allows you to design, model and analyse components looking at the interactions and deflections of the shaft/bearing system and other supporting structures. From this you will be able to simulate realistic working conditions of the gears and bearings under load accurately and quickly, providing durability and NVH analysis.

Since its release in 1995, RomaxDesigner has become the software standard for transmission design and analysis. Our integrated approach allows you to capture all critical performance attributes within one seamless environment. This enables a paradigm shift in design efficiency – allowing companies to transform their design engineering capabilities.

Parallel Shaft Modeller - Key Features



Foundation module (required):

- Rolling element bearings
- Plain bearings and thrust pads
- Shafts (multiple sections)

Modelling of complete transmission systems including:

- Spline connections
- Concept planetary gearsets
- Belt and chain drives
- Concept clutch connections (Parallel Level 2)

Possible configurations:

- Unlimited number of parallel shafts
- Pocket/pilot bearings between shafts
- Multiple-mesh geartrains
- Gears on needle roller and plain bearings
- Manual transmissions (Parallel Level 2)
- DCT and hybrid systems (Parallel Level 2)
- Industrial transmissions
- Off-highway applications (Parallel Level 2)

Speed and torque analysis (powerflow):

- Multiple load case duty cycle for the gearbox road load data
- All component loads from gearbox powerflow
- Multiple power inputs/outputs; split convergent powerflow (Parallel Level 2)
- Multiple powerflows using clutchable connections (Parallel Level 2)

Analysis:

- Non-linear system deflection analysis
- Component duty cycle life calculations
- Mesh misalignment of gears automatically derived from system deflections
- Torsional wind-up and load sharing with split powerflow
- Spline rating to SAE guidelines and DIN 5466
- Bearing life calculations to ISO 281 and Romax adjusted rating including misalignment and clearance
- Full system flexibility of housing and carrier components (Structural Flexibility module)

Databases

- Integral bearing catalogues from major manufacturers
- User-definable catalogue for custom rolling bearings
- User-definable databases for gear and shaft materials and lubricants

Design manipulation:

- 3D geometry for all components
- 'Point and click' functionality for modelling in 3D graphical user interface
- Gear set variants allow a single gearbox to use many different gearset combinations

Reporting and connectivity:

- Output to printer, HTML, spreadsheet and Windows clipboard
- Animated 3D results saved directly to *.avi
- Basic shaft dimensioning

Optimisation and design studies:

- Bearing pre-load comparison tool

Extended modules:

- Further Bearing Analysis (DIN/ISO 281 Supplement 4)
- Advanced Radial Ball Bearing
- Advanced Cylindrical Roller Bearing
- Advanced Taper Roller Bearing
- Advanced Full Complement Needle Roller Bearing
- Advanced Four Point Contact Bearing
- Shaft Fatigue Analysis and Optimisation
- Hypoid Gear Design and Rating
- Spiral Bevel Gear Design and Rating
- Straight Bevel Gear Design and Rating
- Helical Gear Macro-Geometry Optimisation
- Helical Gear Micro-Geometry Optimisation
- Geartrain Transmission Error Analysis
- RomaxNVH – Gear Whine
- RomaxNVH – Component Mode Synthesis
- Housing Influence
- Structural Flexibility
- Export Bearing Element Loads to FE
- FE Solver
- CAD Export module (IGES + STEP)
- XML interface
- LDP interface
- Romax Design of Experiments (DoE)
- Reliability prediction
- Duty cycle generation

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