

Timing and Auxiliary Drive Analysis Using VALDYN

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- Case Studies
- Design Considerations
- Belt Analysis
- Chain Analysis

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- **Design Considerations**
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Chain design and analysis

- Design considerations and what we study to achieve them
 - Reduce maximum chain force
 - Tuning tensioner leakdown rate and preload
 - Consider oval sprockets
 - Investigate sprocket size (effect of inertia and number of teeth)
 - Reduce guide/chain contact force (reduce guide wear)
 - Optimise guide profile (shape)
 - Tuning tensioner leakdown rate and preload
 - Reduce friction
 - Optimise guide profile (shape)
 - Tuning tensioner leakdown rate and preload
 - Reduce NVH
 - Oval sprockets
 - Tooth geometry
 - Number of teeth on sprockets
 - Tuning tensioner leakdown rate and preload
 - Consider pressure relief valve in tensioner

- Design considerations and what we study to achieve them
 - Reduce belt force
 - Tuning tensioner spring rate and preload
 - Consider oval pulley(s)
 - Investigate pulley size (effect of inertia and number of teeth)
 - Reduce belt flap (transverse vibration)
 - Tuning tensioner spring rate and preload
 - Consider span lengths
 - Reduce belt tooth shear forces (timing belts)
 - Tuning of belt and pulley tooth geometry
 - Investigate with different rubber properties (e.g., stiffness)

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