

Next Generation FSAE Drivetrain



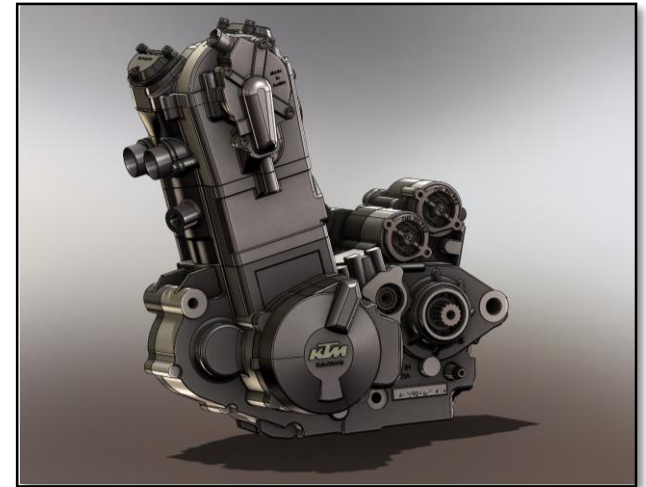
Project Goals/Purpose

- Future Involvement in FSAE Competition
- Unique and Innovative Design
- Complete Engineering Analysis
- Create Expo Showcase
- Use and Impart Project Learning

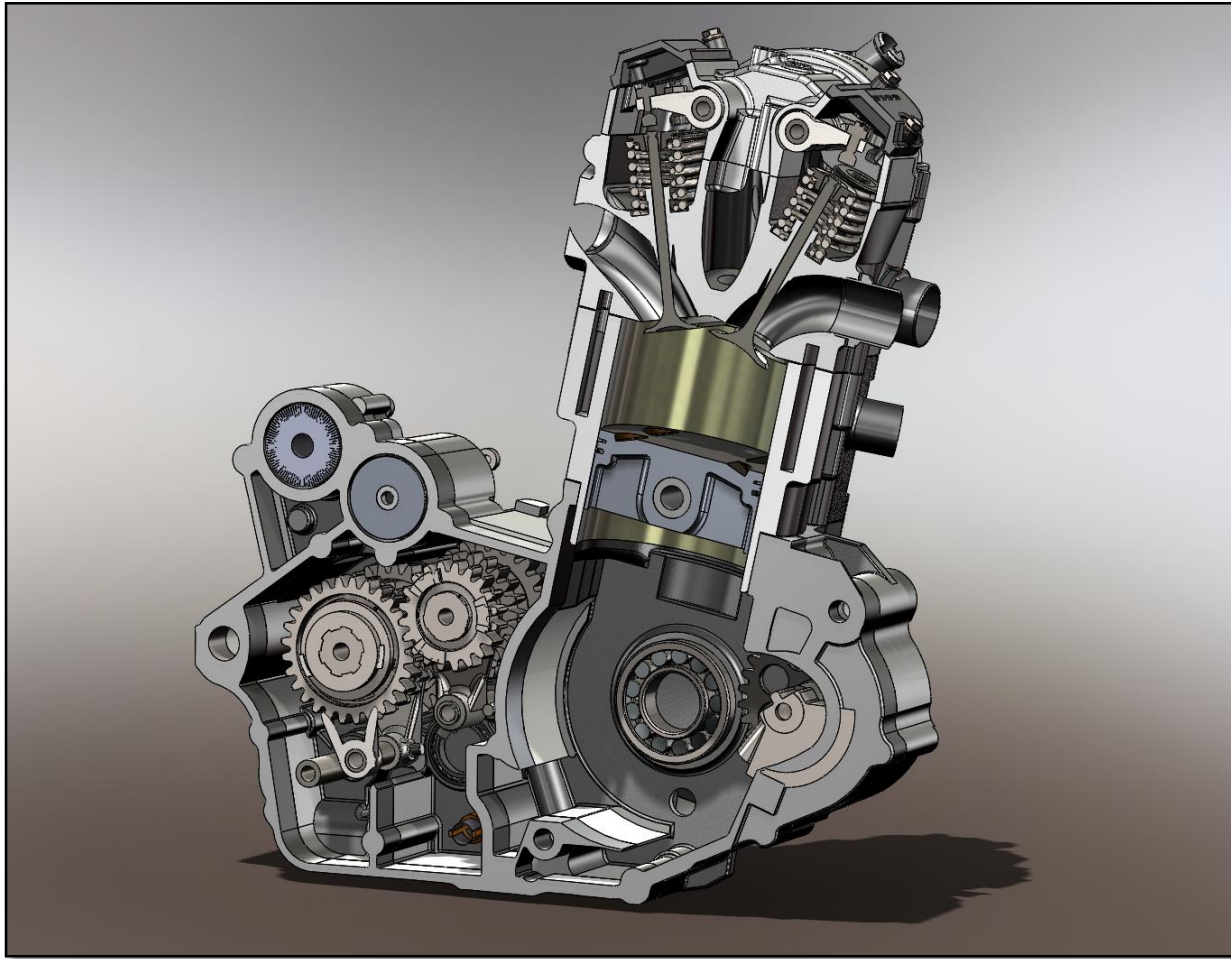


General Information

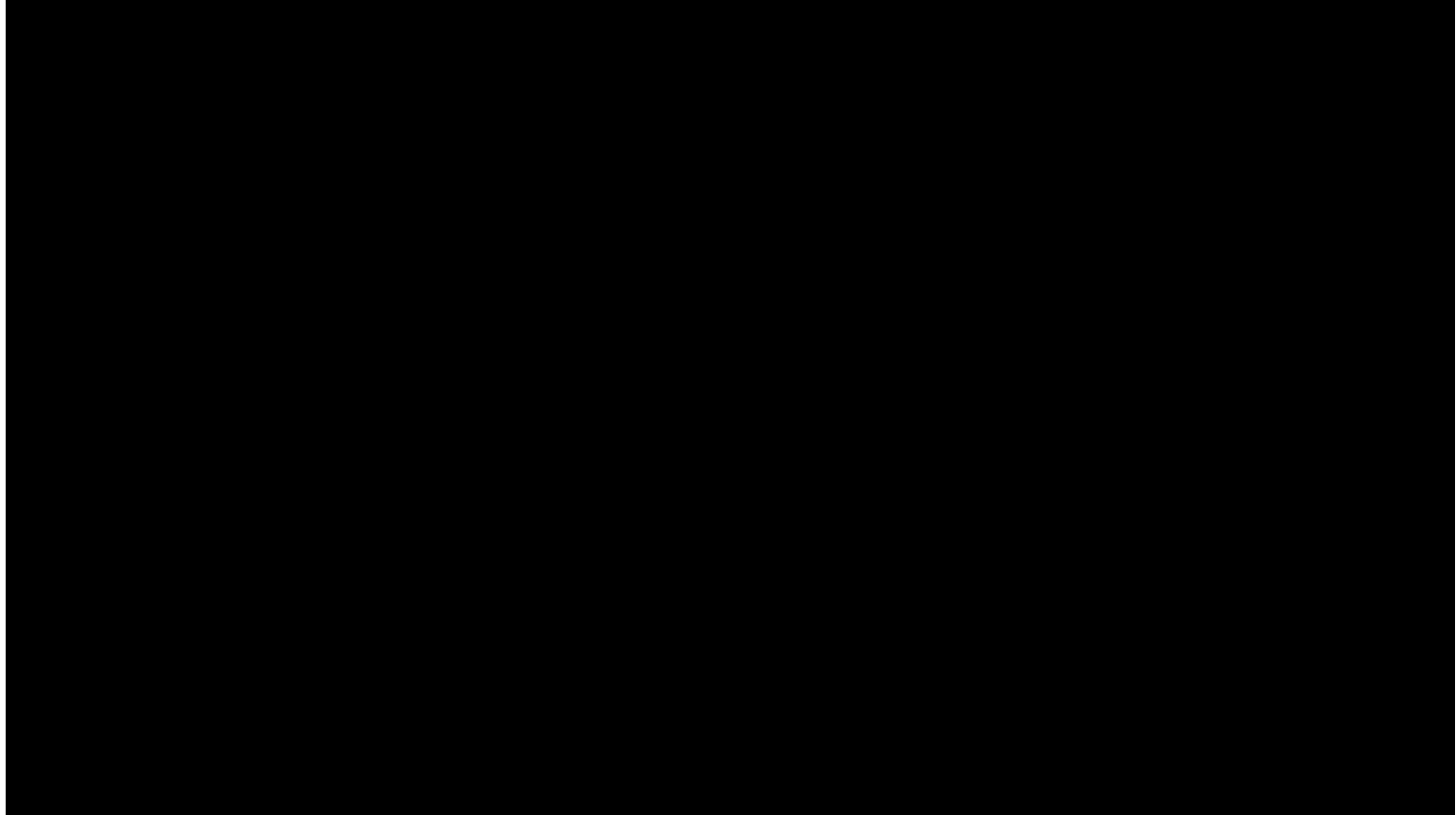
- Reverse engineer existing engine
- Understand internal engine operations
- Apply knowledge to new design
- Repackage KTM 540 SX engine
- Determine drivetrain configuration
- Explore engine mountings



540 Engine Cross Section



Transmission Gear Train



Transition to Next Gen from KTM Parts

- Apply project learning from original KTM design
- Apply FSAE rules to New Design

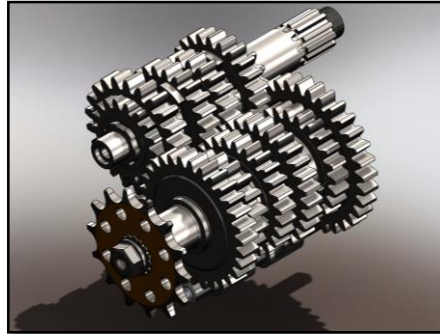
Design Goals

- Compact overall package
- Innovative configuration
- Light weight and powerful



Integrated KTM Components

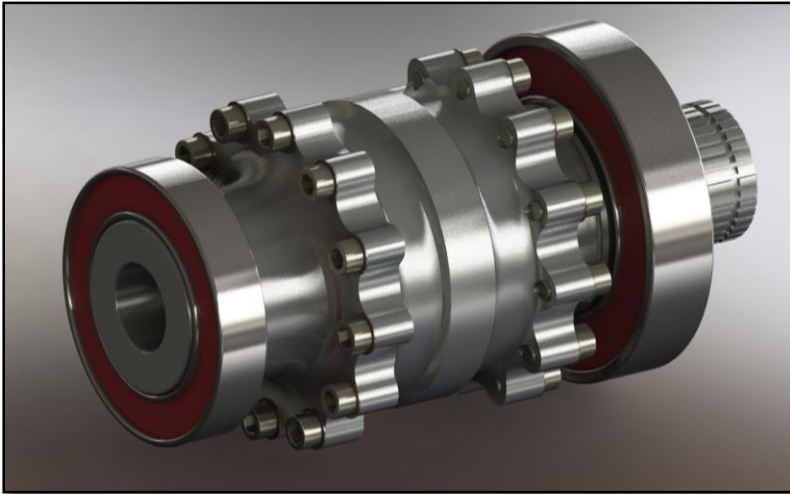
- Transmission
- Clutch
- Crankshaft
- Piston and Connecting Rod
- Cylinder Head Assembly
- Balancer Shaft



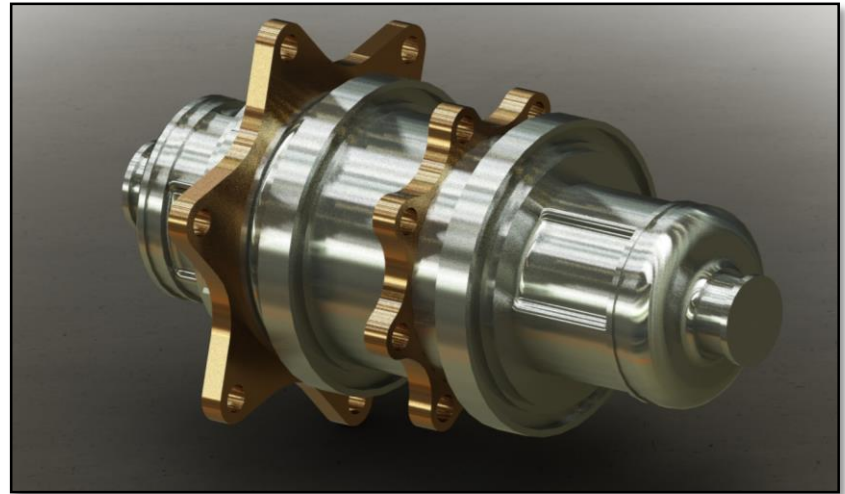
Differential Selection

- Limited Slip Differential Features

Drexler Differential



Taylor Differential



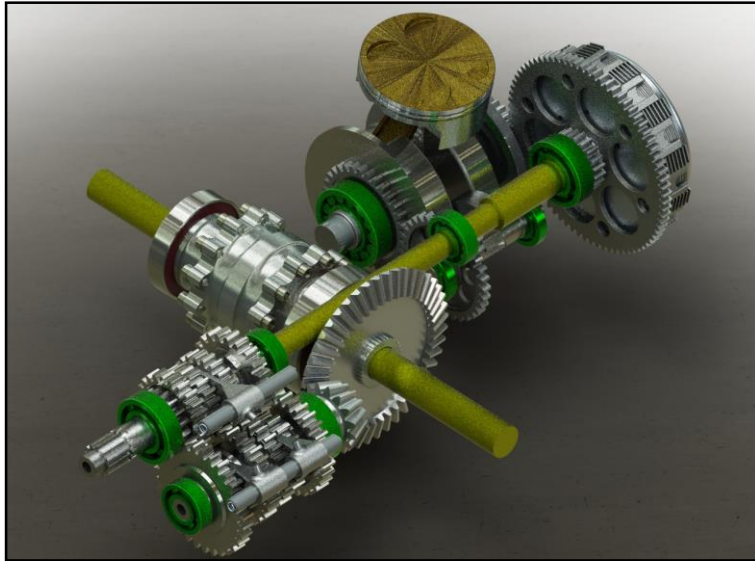
Ring and Pinion Drive

- Torque Requirements
 - ~3000 (lb-in) and 1000 (lb-in)
- Ring and Pinion Options
 - *4:3 and 3:1 configuration*
- Mounting the gears in the case
- Bearing Stresses/Tolerances

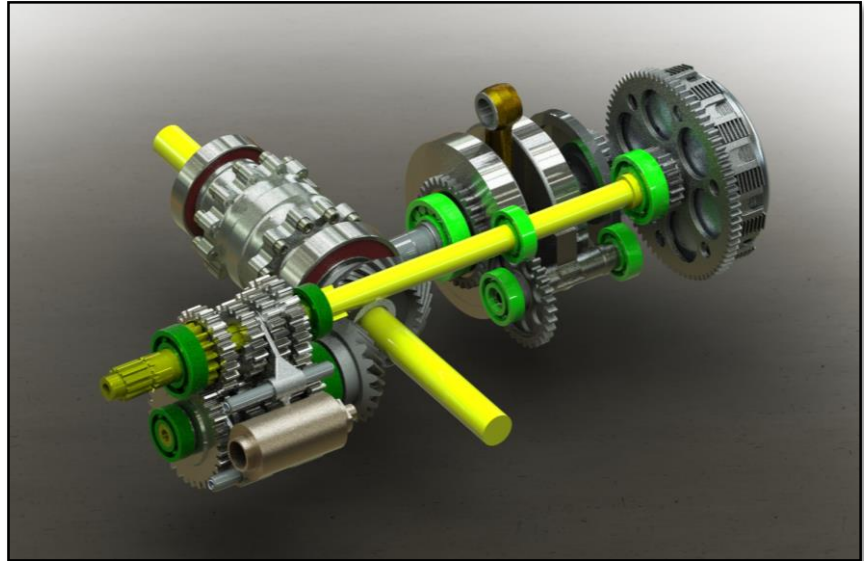


Concept Layout

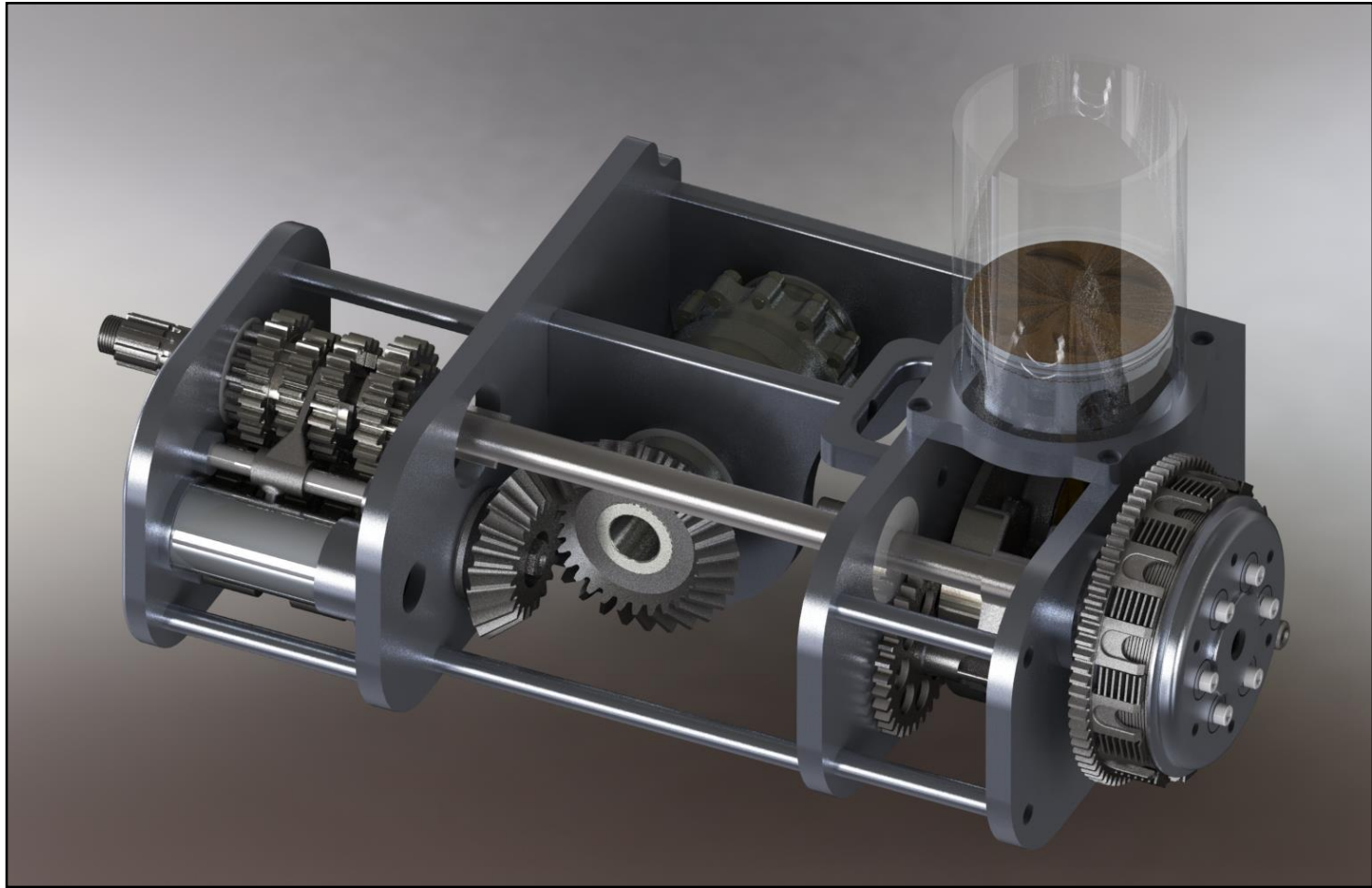
3 to 1 Ring & Pinion Configuration



4 to 3 Ring and Pinion Configuration



Final Concept Layout



Subsequent Case Design

- Engine Case Integrity
- Timing Chain Routing
- Gearing Stresses
- Ring and Pinion Interface
- Engine Cooling and Lubrication



Questions or Comments?

