



UNH BAJA SAE

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Project Scope

Built upon the 2025 UNH Baja car, this project focused on improving speed, reliability, durability, and using data to guide tuning.

Baseline Vehicle Assessment

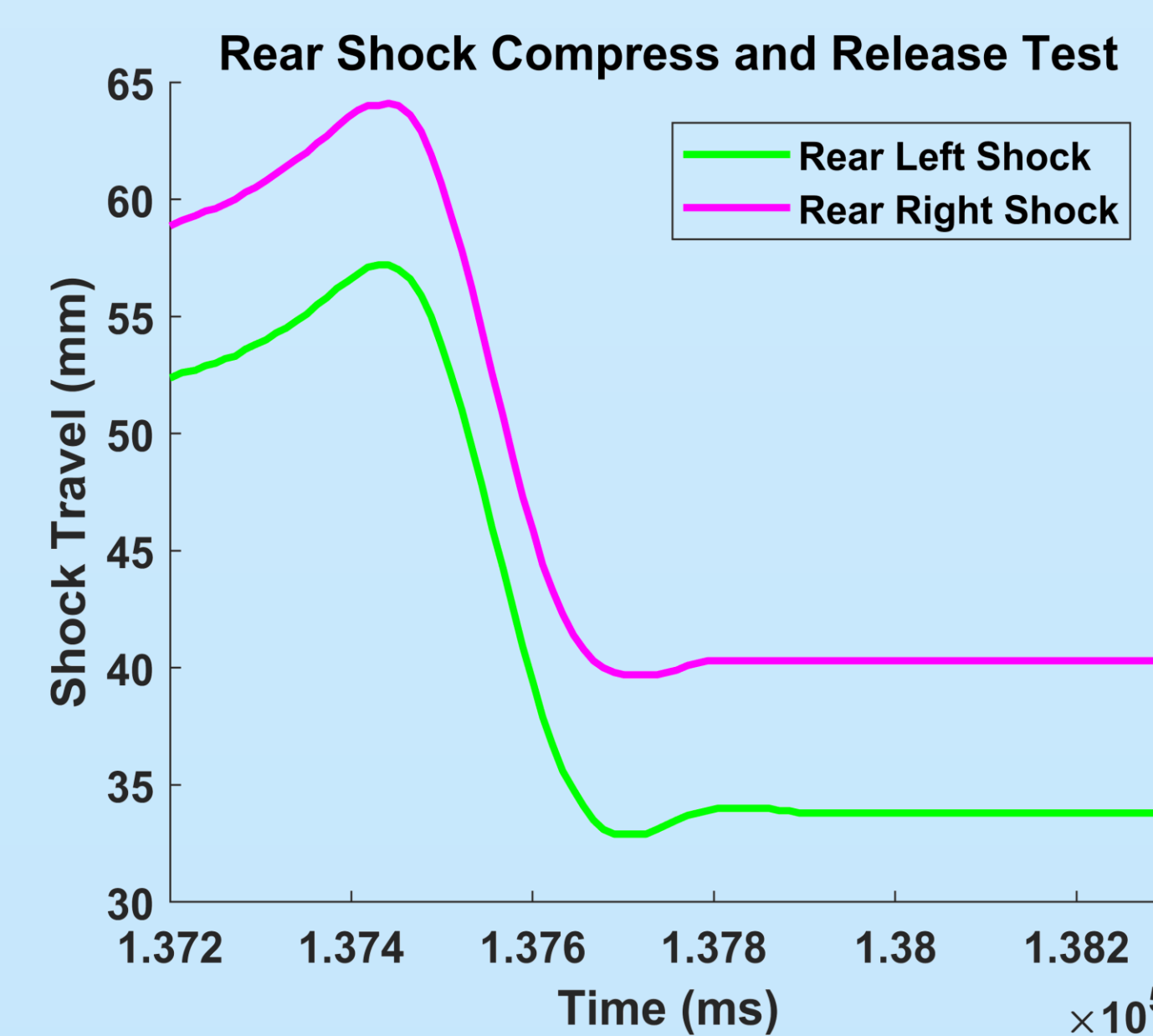
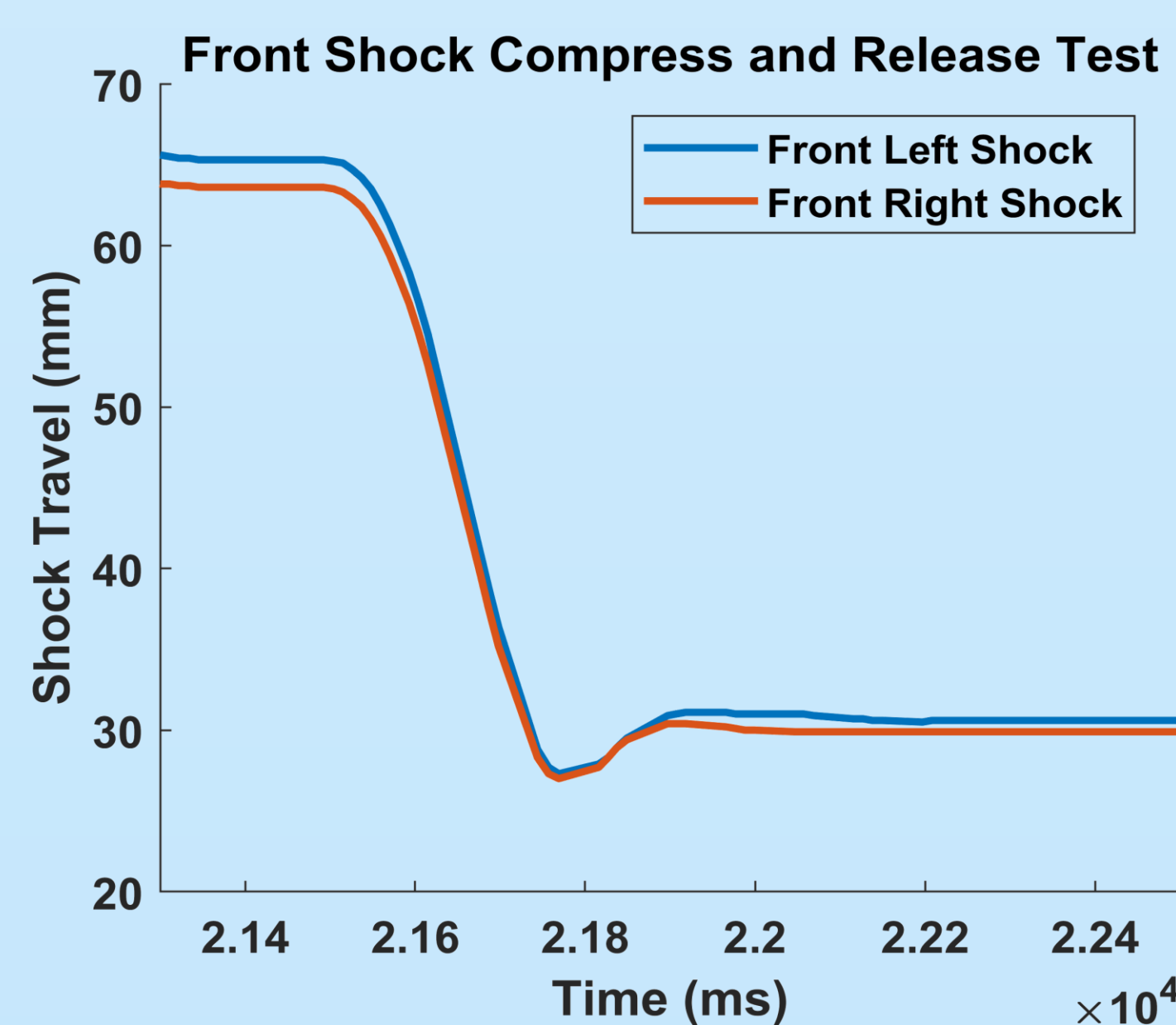
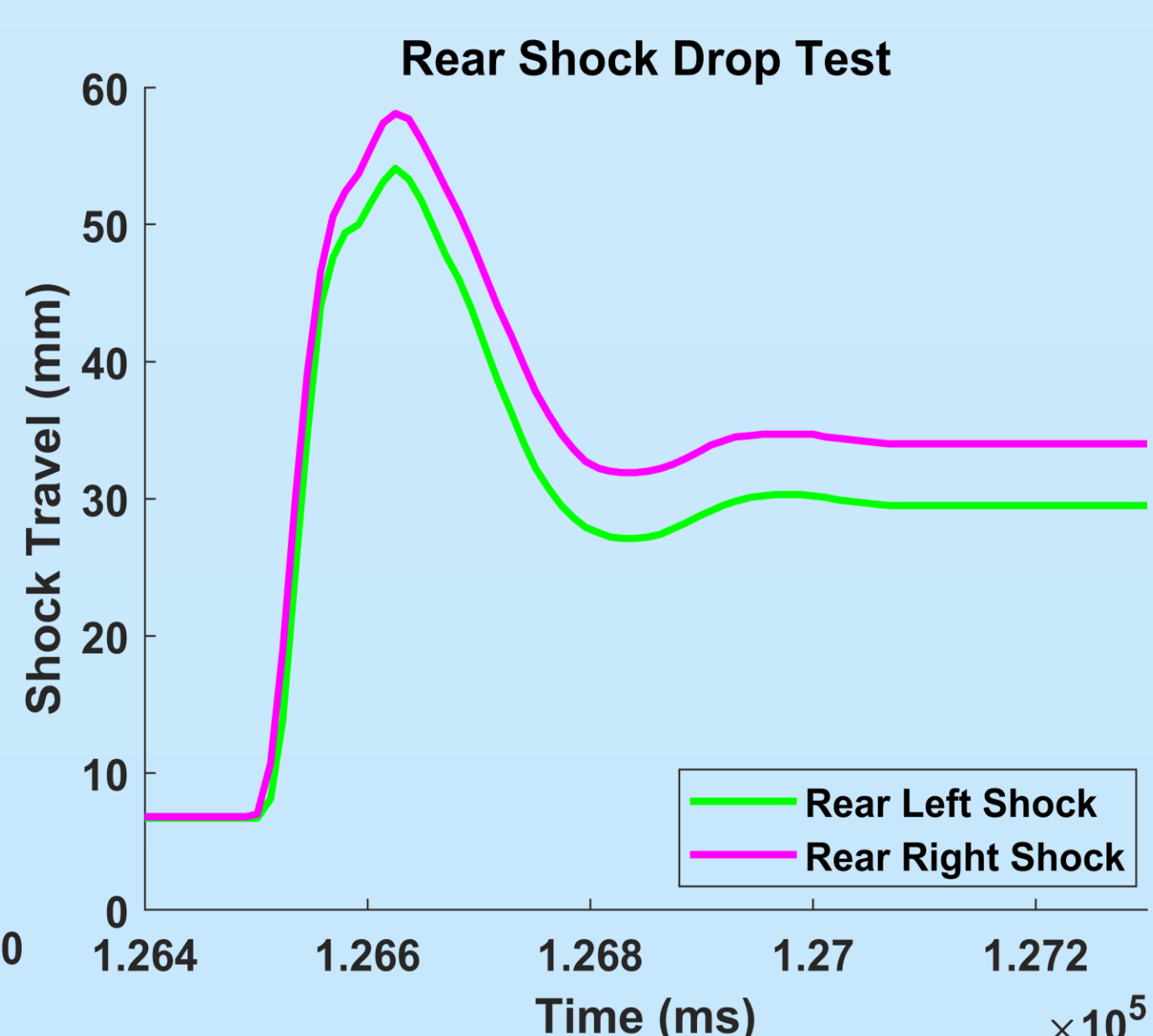
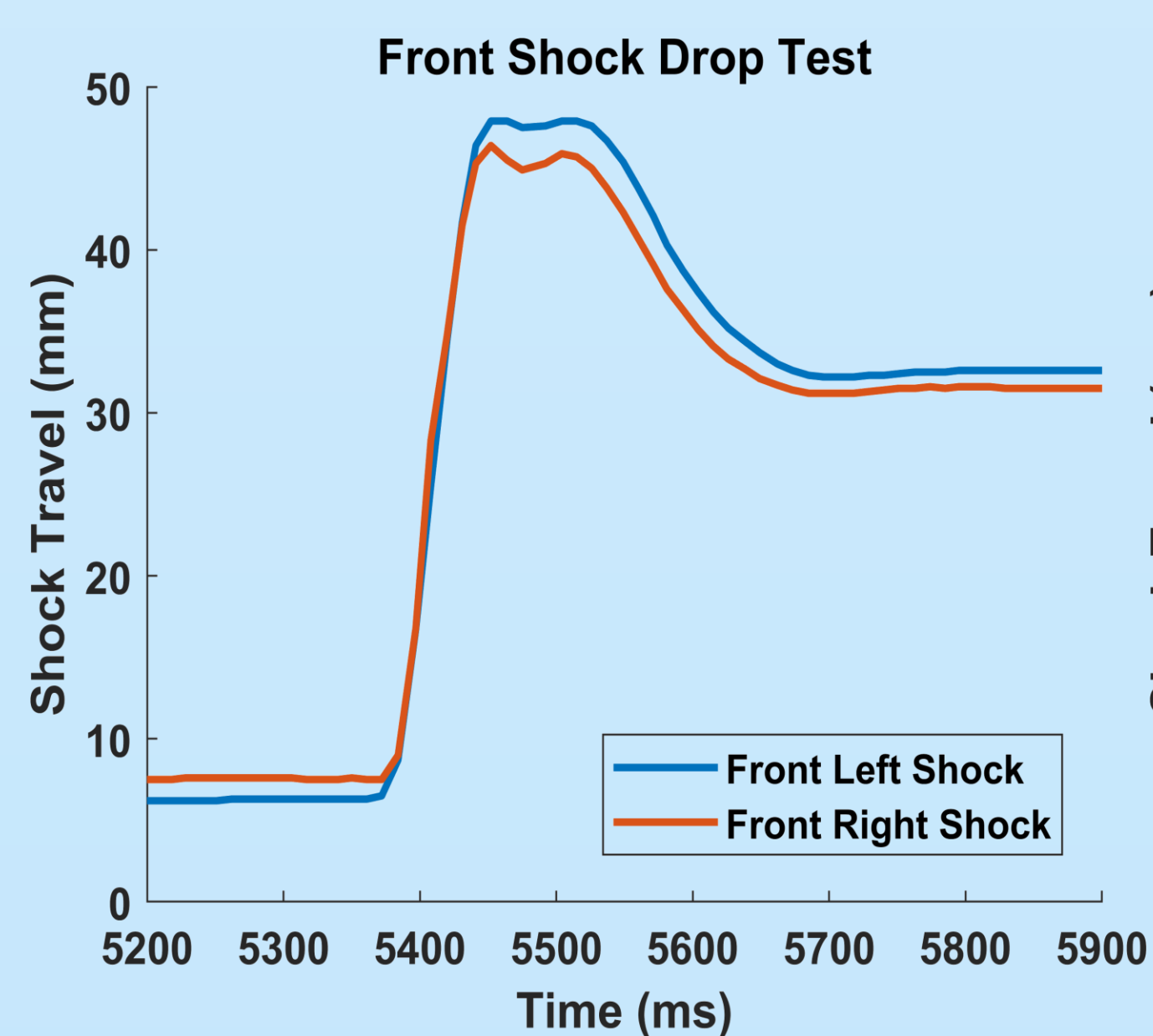
- Top speed was 17 mph
- Rear-wheel drive only
- No way to gather data
- CVT and drivetrain not tuned
- Driver comfort needed improvement

Design Objectives

- Increase top speed to 30+ mph
- Add functional 4WD
- Use telemetry for suspension tuning
- Improve driver comfort

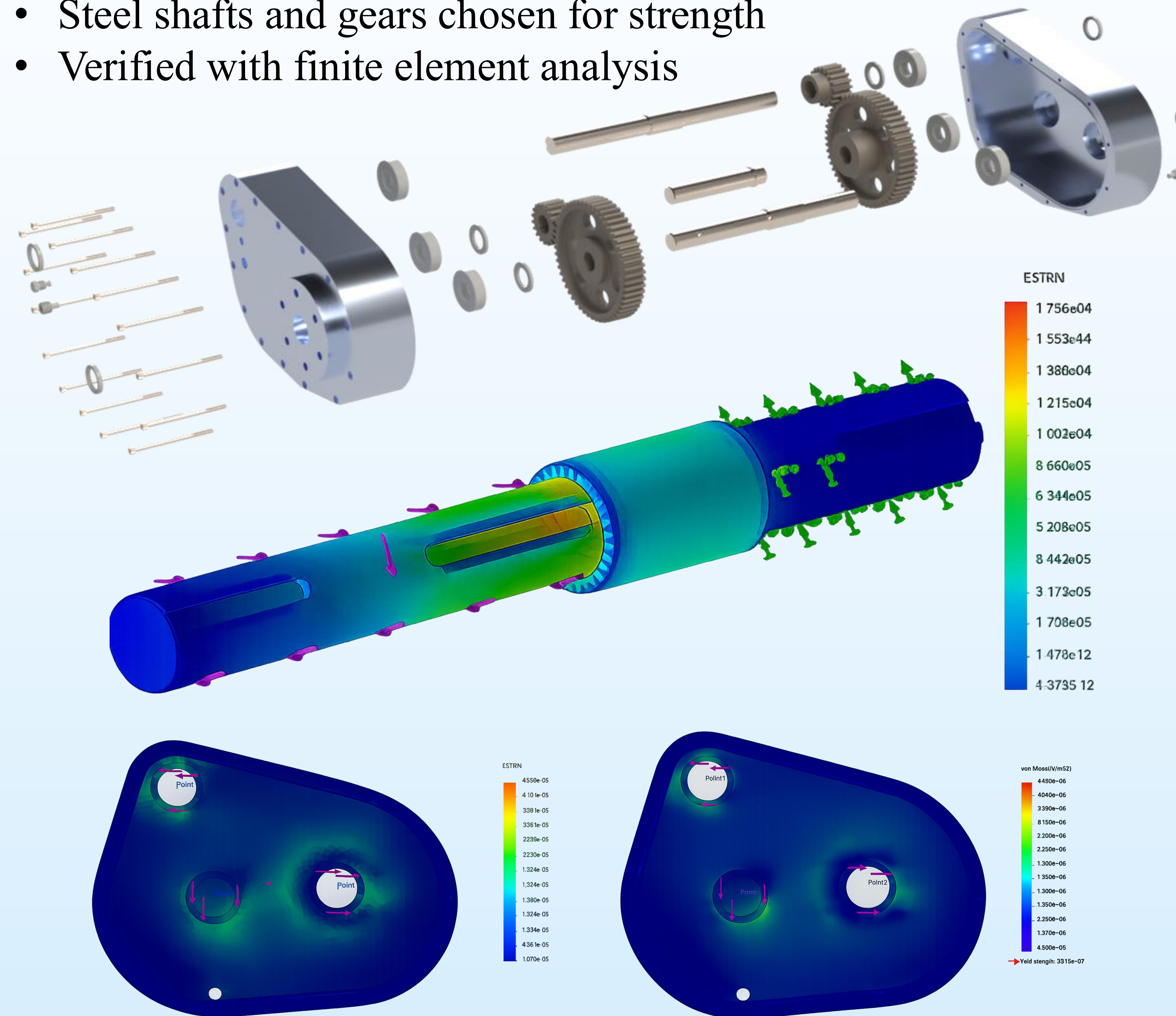
Suspension Telemetry

- Designed a custom system to record shock travel in real time
- Ran static and dynamic tests
- Used collected data to tune suspension setup
- Improved ride quality and comfort



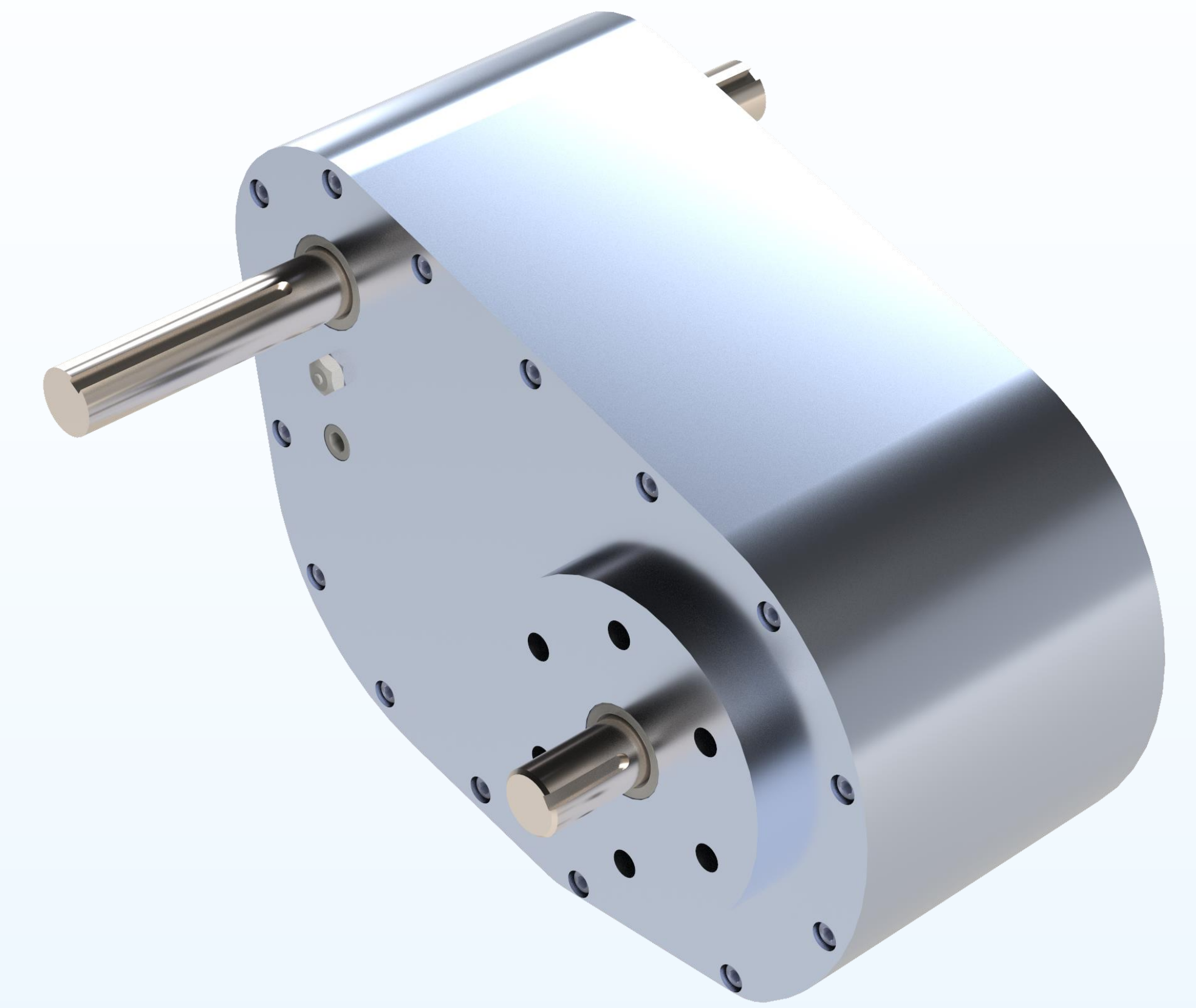
Custom Lightweight Gearbox

- Removed reverse, high/low, and neutral to reduce weight
- CNC machined by Turbocam from 6061 aluminum
- Steel shafts and gears chosen for strength
- Verified with finite element analysis



CVT Optimization

- Tested different ramps, springs, and flyweights
- Tuned clutch response for better power delivery
- Compared drivetrain performance across setups
- Established final baseline tune



4WD System Integration

- Added driveshaft shield for safety
- Built false floor to protect driveline parts
- Improved traction and off-road performance

Project Status

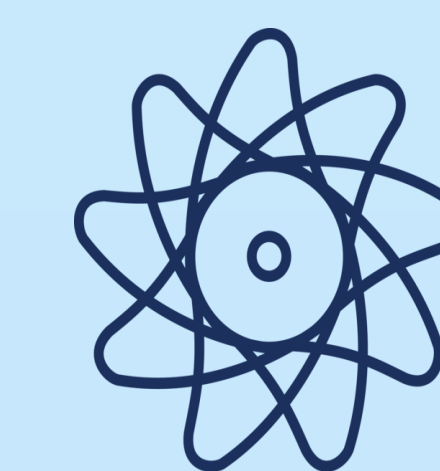
- Gearbox manufacturing in progress at Turbocam
- Suspension telemetry installed and tested
- CVT baseline tune completed
- 4WD system installed
- Current top speed: 22 mph (+5 mph)

BAJA SAE Competition

- Competing at the 2026 Baja SAE New York event
- Acceleration, maneuverability, endurance events
- Business and design judging events

Acknowledgements/Sponsors

Project Advisor : Juan Carlos Cuevas Bautista



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