# Introduction

## The simple answer to torque steer:

## “Revo” Suspension


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- *Dipl. – Ing. Marc Simon*
- *Dipl. – Ing. Lauri Ohra-aho*

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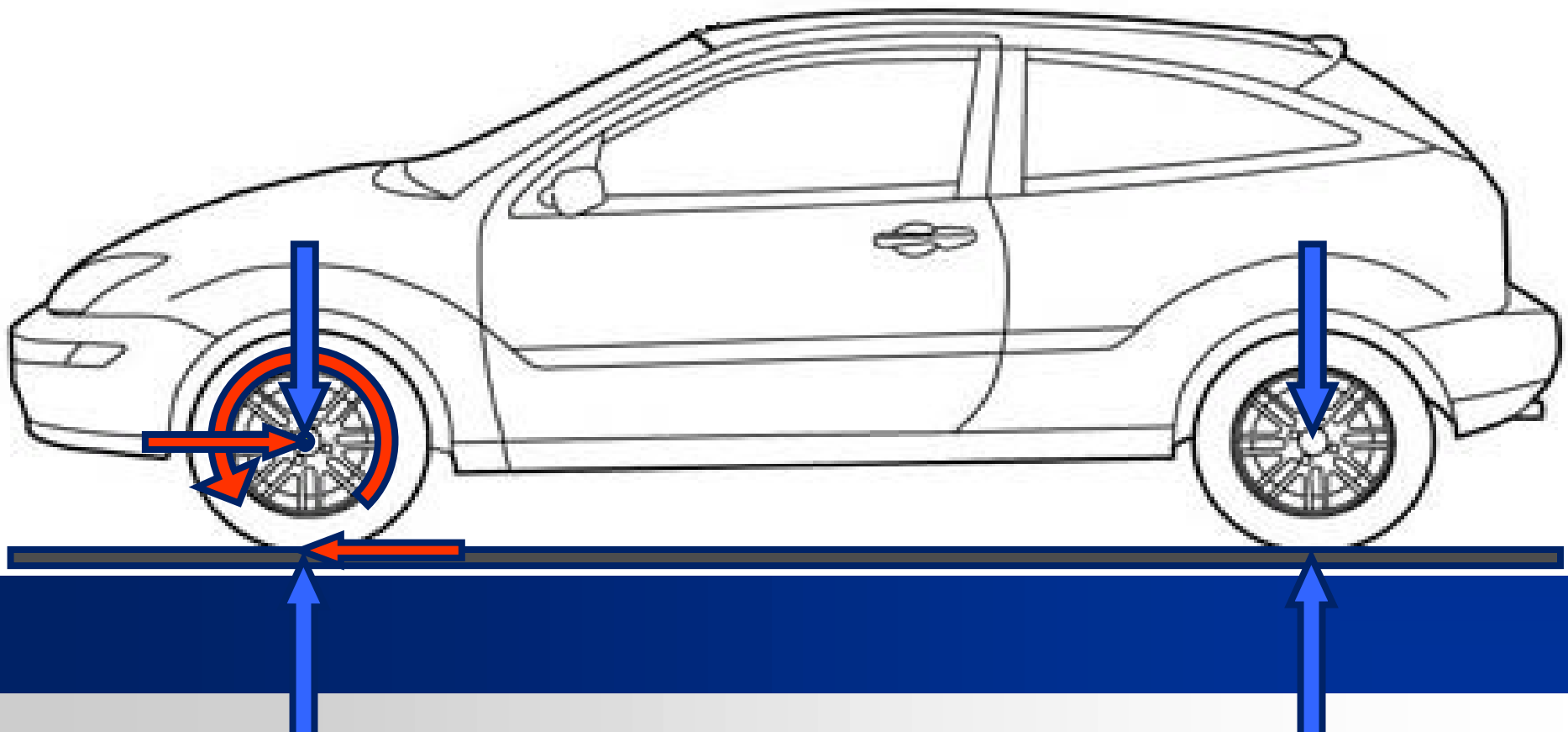
# Wheel Forces and Moments



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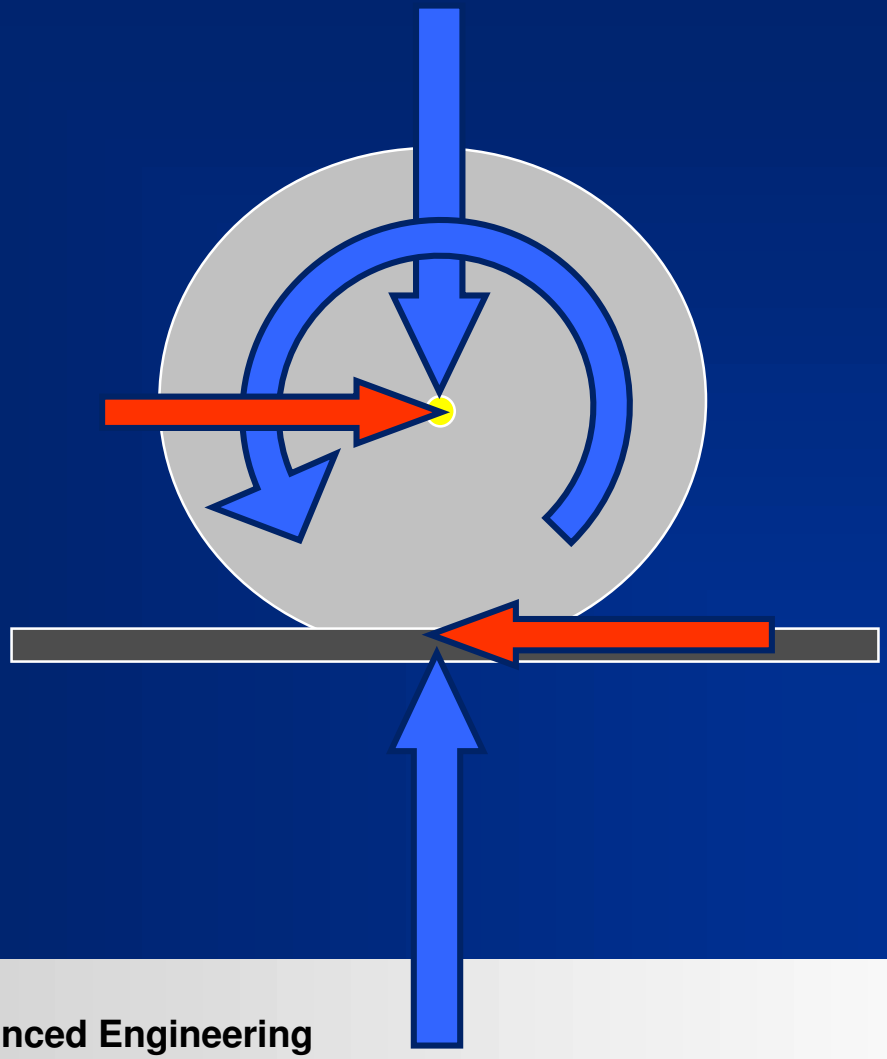

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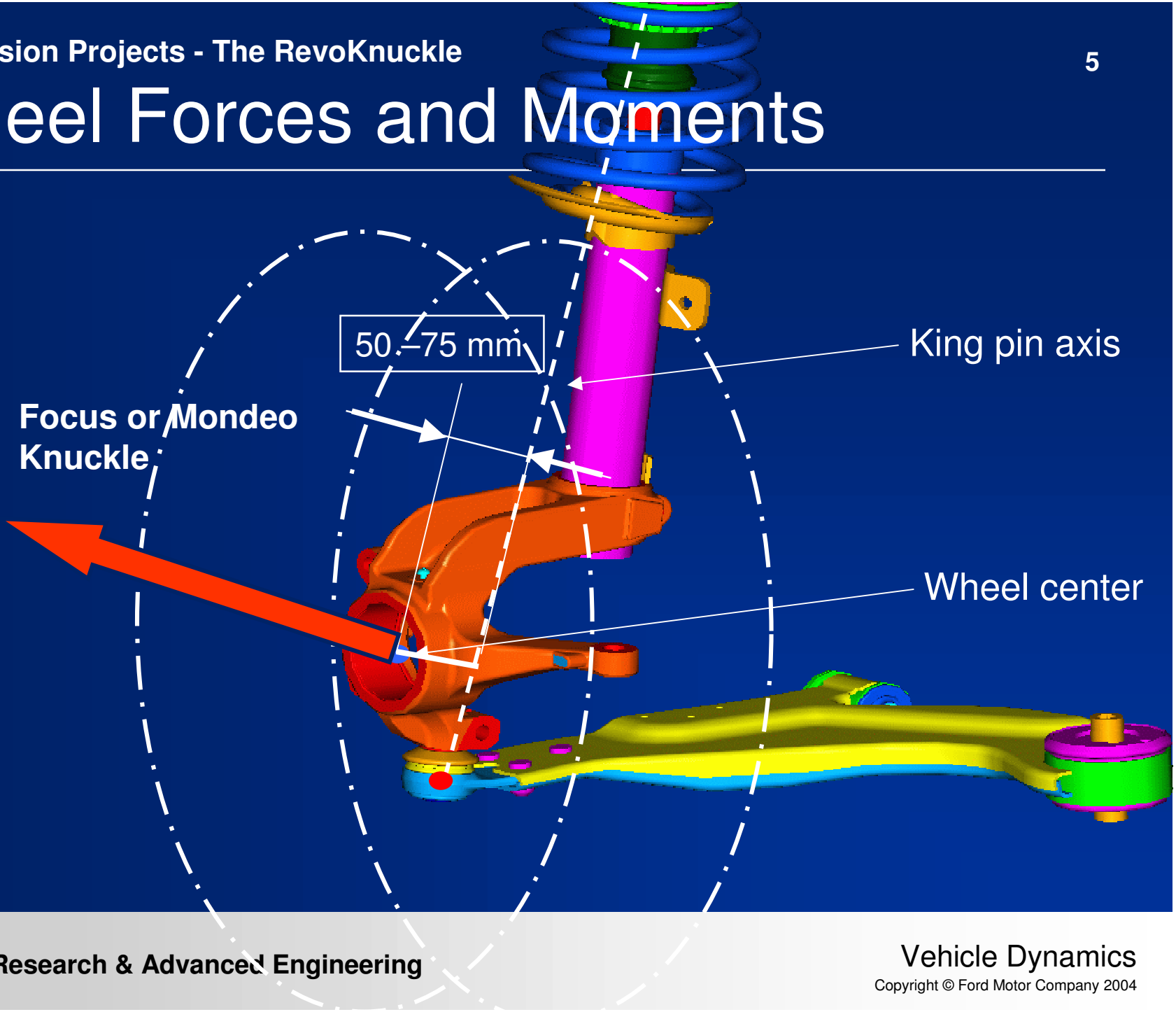
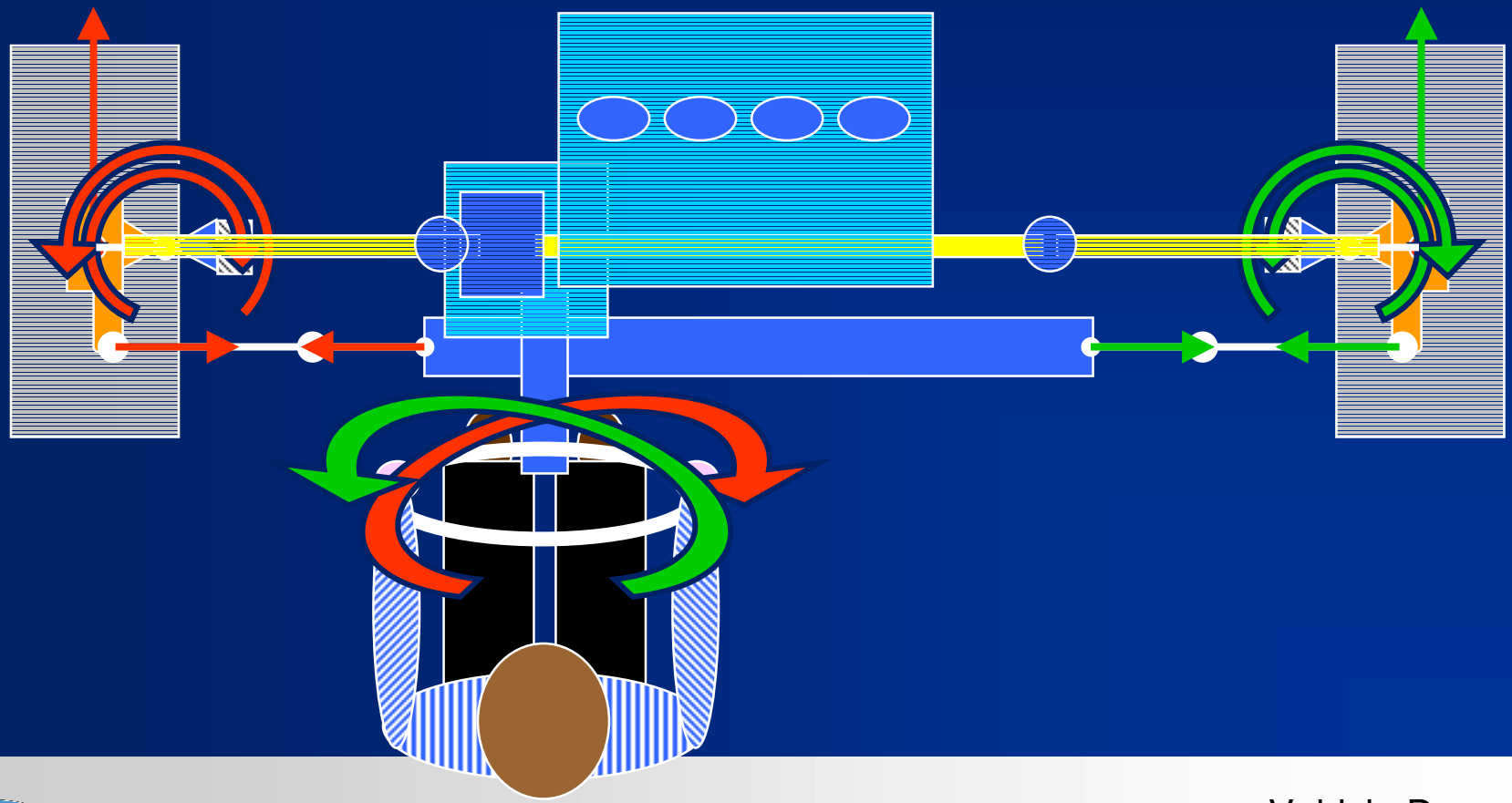


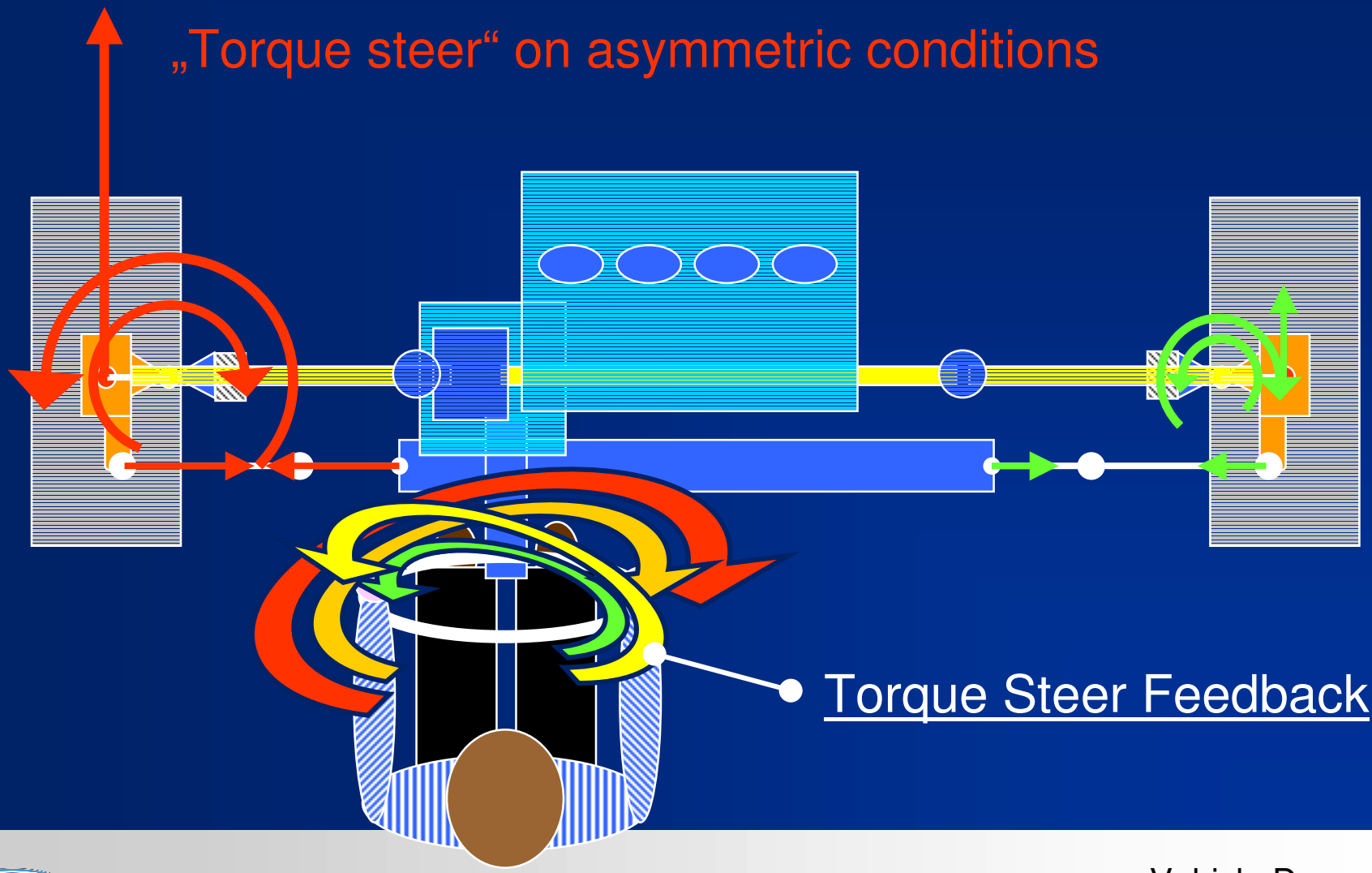
# Disturbing Forces and Moments

- No „Torque Steer“ on symmetric conditions

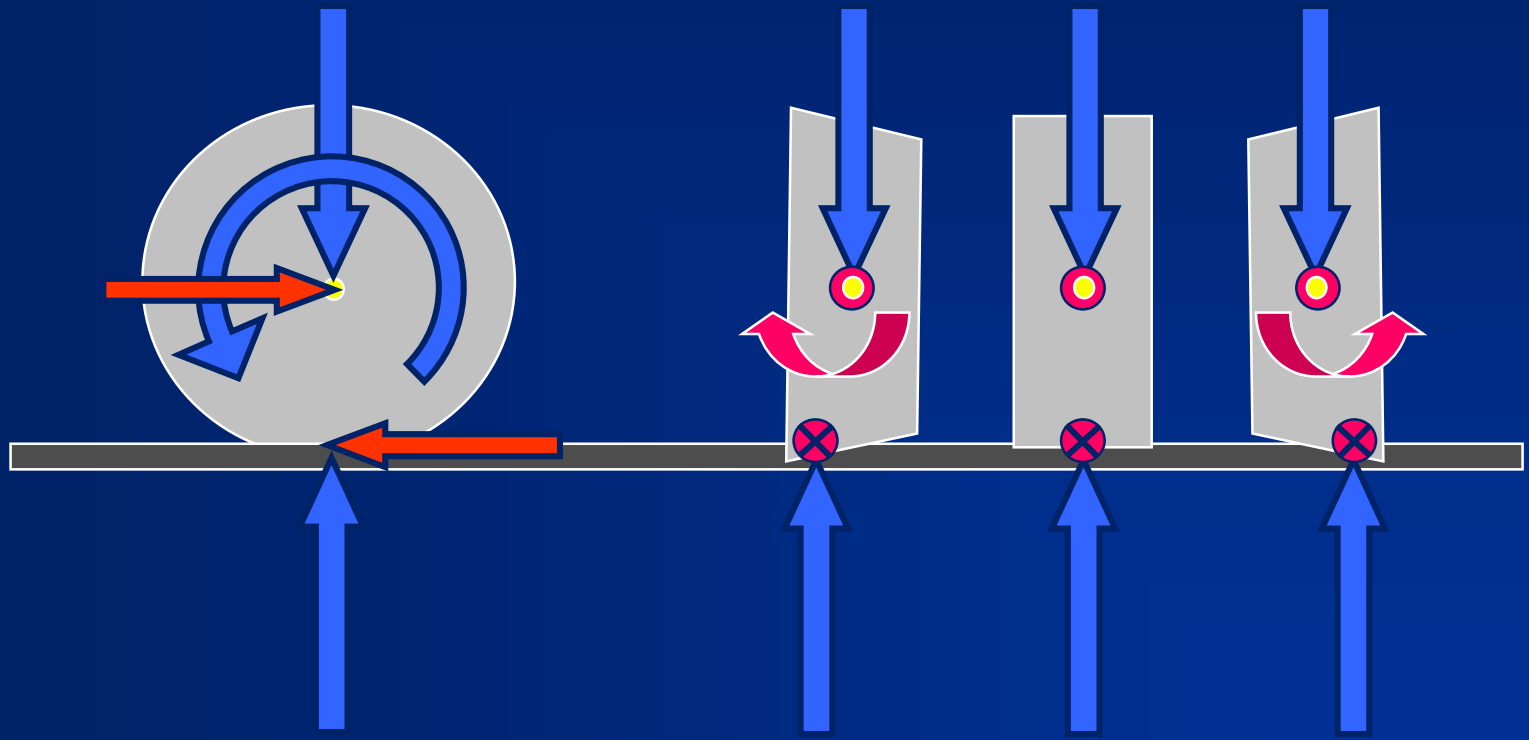


# Technology Description & Scope

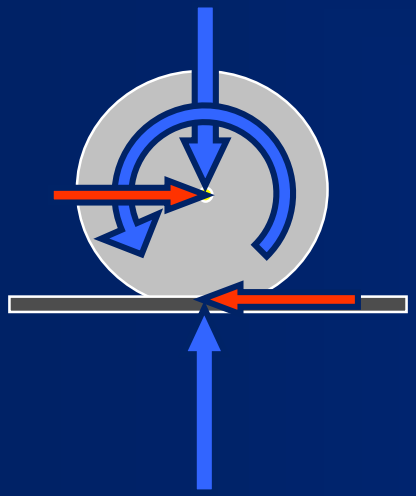


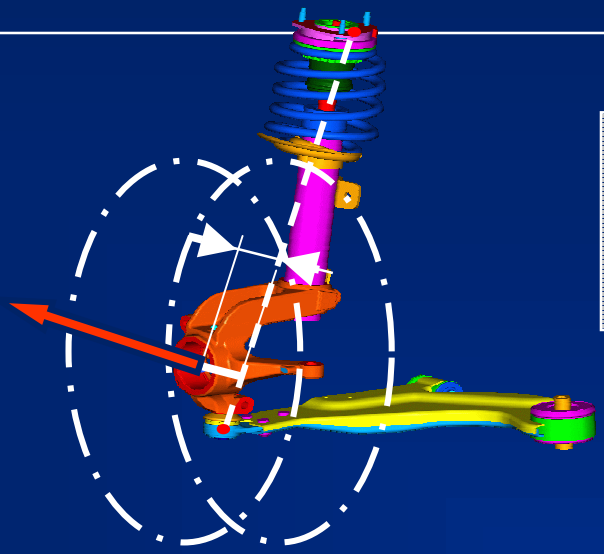


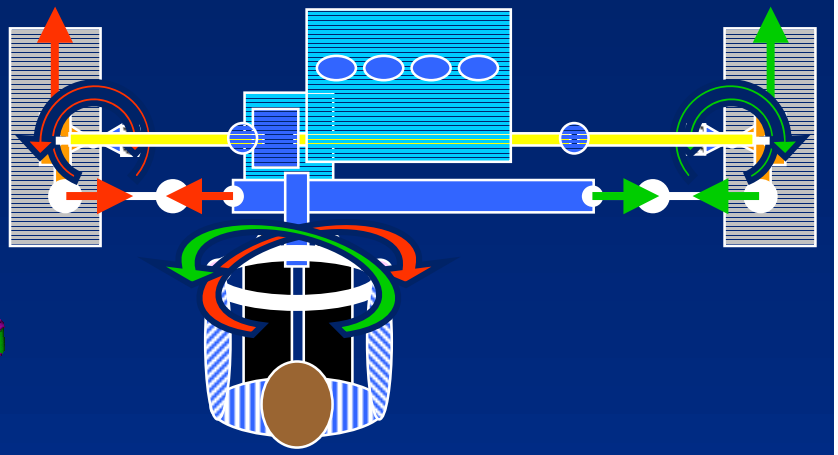
# Tire Conicity



# Torque Steer Contributors







- Road Conditions (friction and surface)
- Vehicle State (cornering,roll., acc.)
- Weight Distribution (loading)

- Suspension Geometry (kingpin offset, camber, caster, tolerances)
- Tire Quality (Conicity, wear, profile)
- Wheel Geometry (size, uniformity, wheel offset)

- Engine (torque, alignment)
- Differential (friction, self locking effect, Torsen differential)
- Drive Shafts (alignment, length, symmetry)

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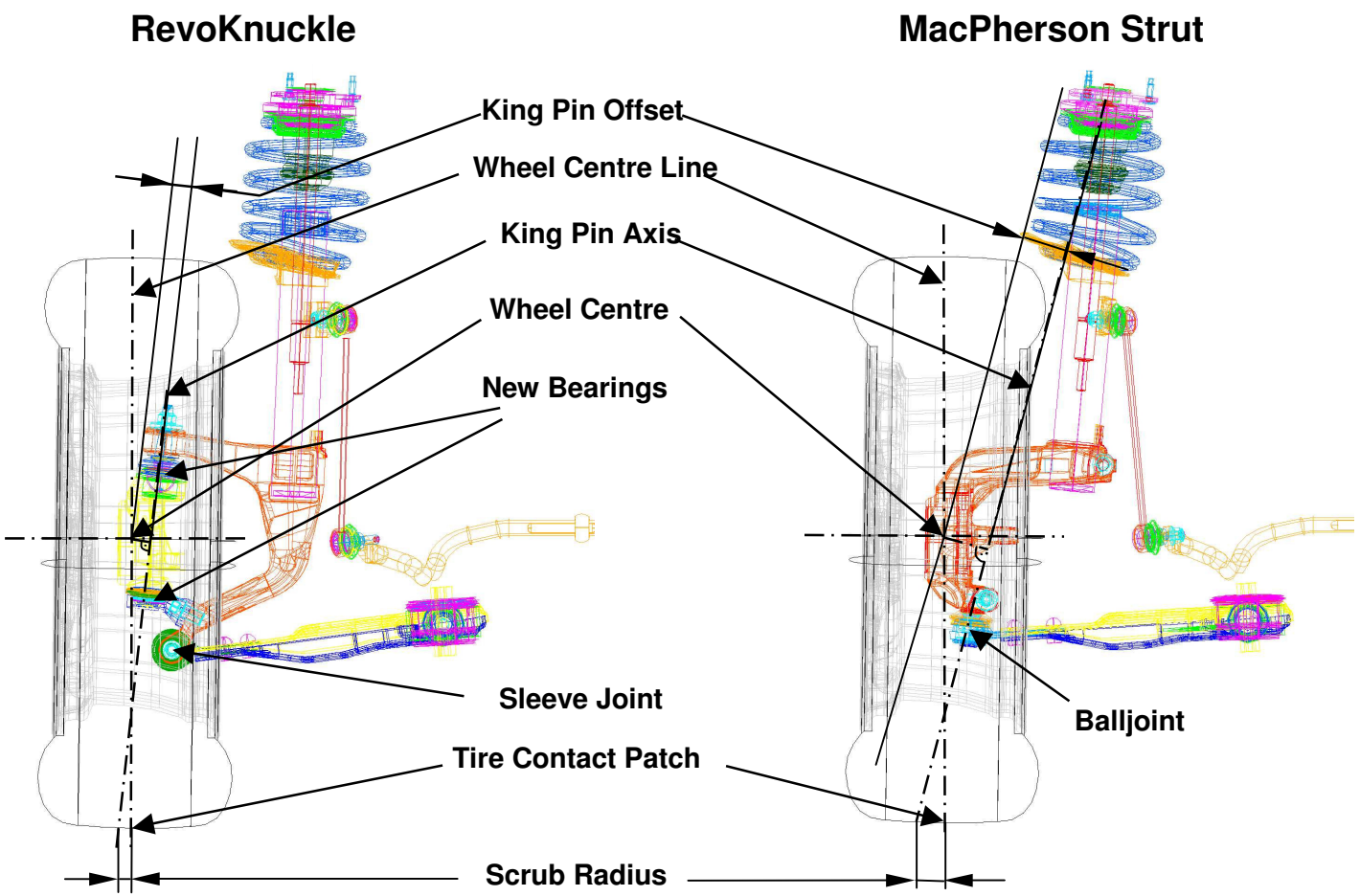
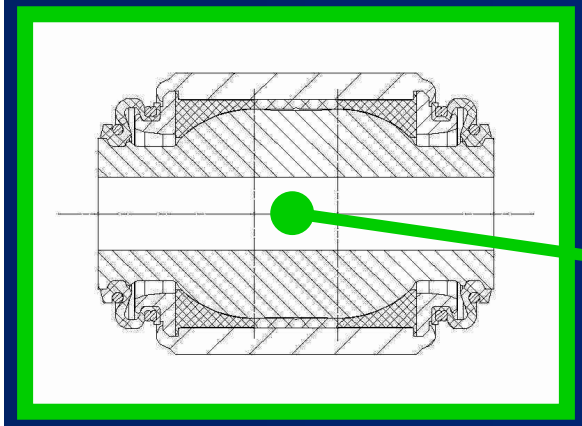
# RevoKnuckle vs. McPherson



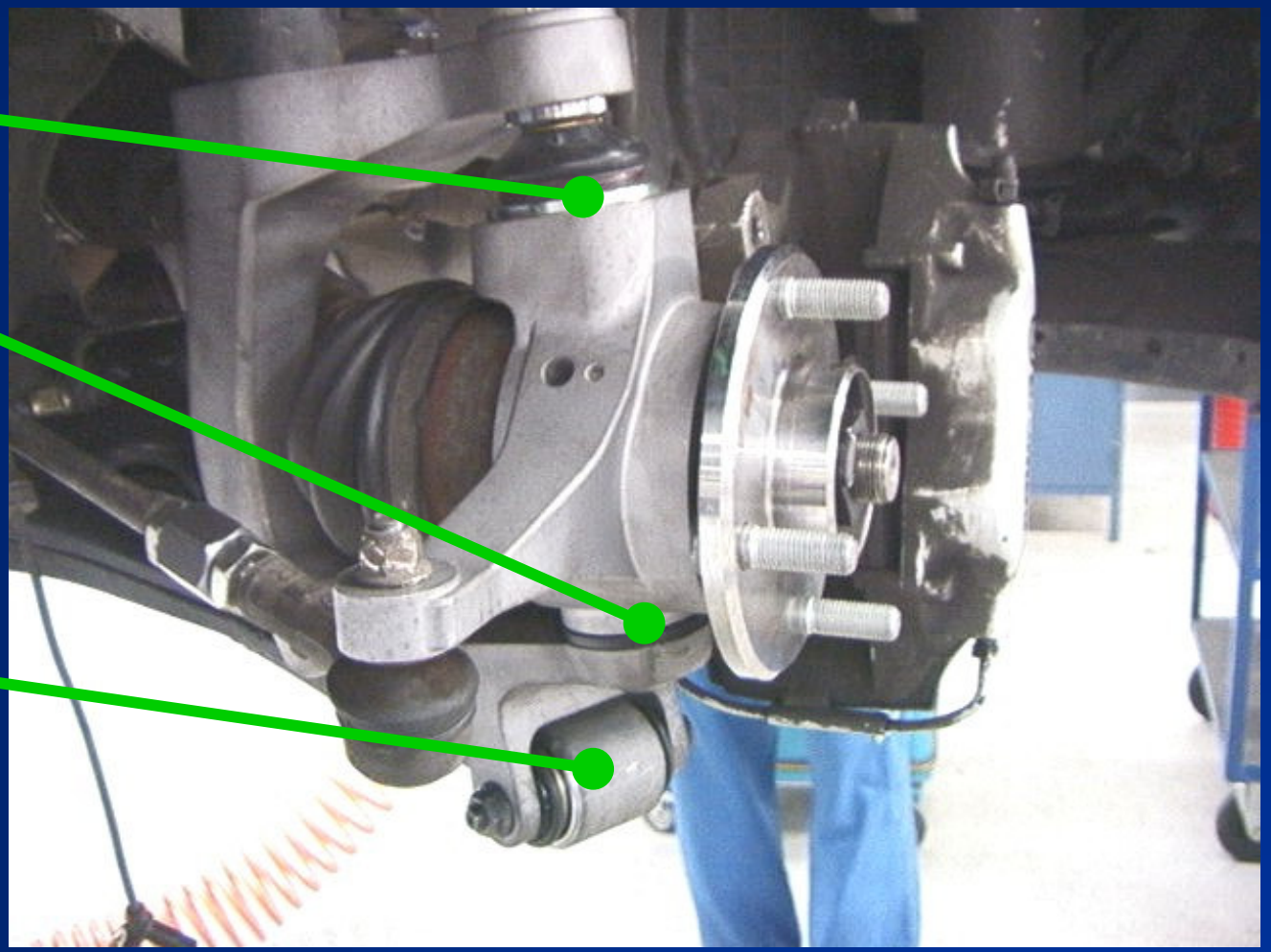
# RevoKnuckle – RevoKnuckle Joint Concepts

Ball Joint

Roller Bearing



New FFA / ZF
Patent Application



# Advantages concept

- Improved Vehicle Dynamics Performance
  - Torque Steer
  - Wheelfight
  - Steering Nibble
  - Brake Judder
- Reduced torquesteer sensitivity to changes in tire size (low aspect ratio) and tire conicity
- Fits to McPherson package, no body changes
- Less expensive than Double Wishbone suspension
- Lighter than Double Wishbone suspension
- Smaller Kingpin offset vs. Double Wishbone suspension : 20-30 vs. 40 mm

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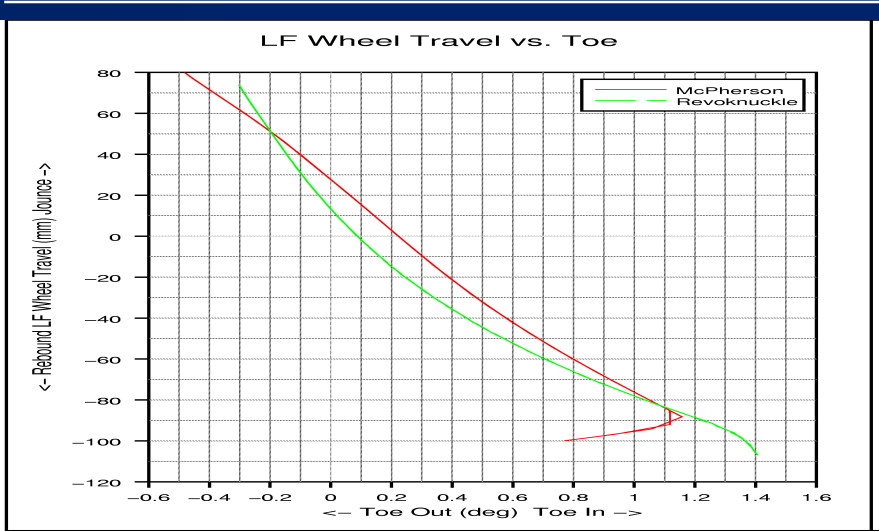
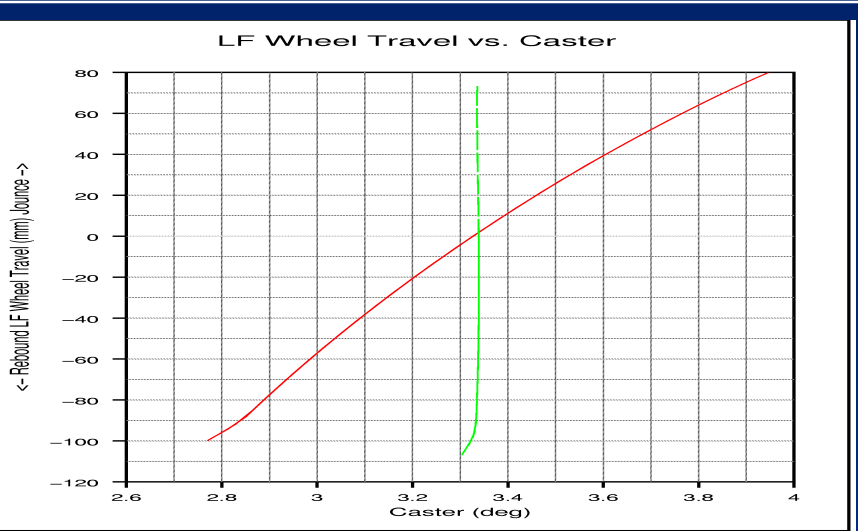
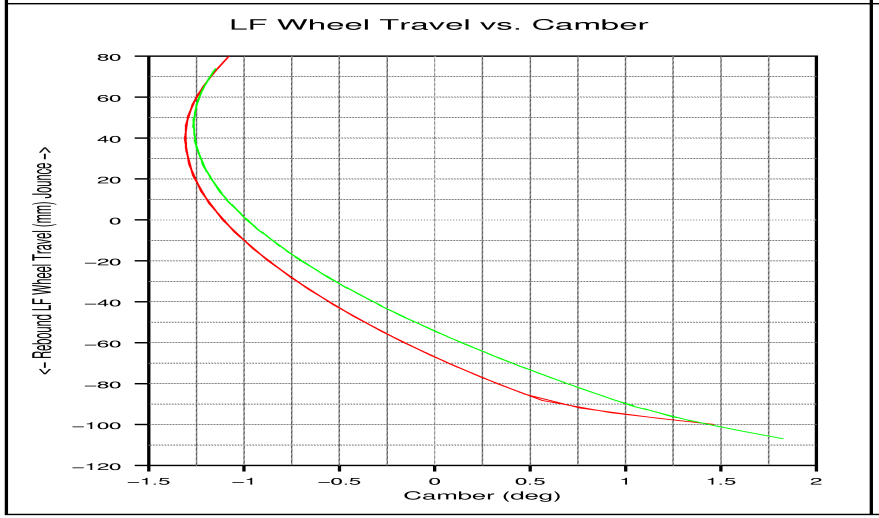
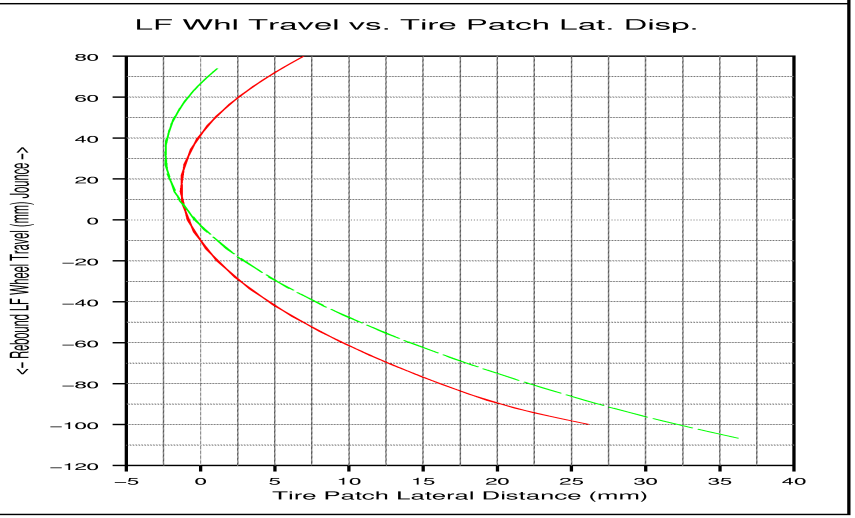
# Kinematics Results

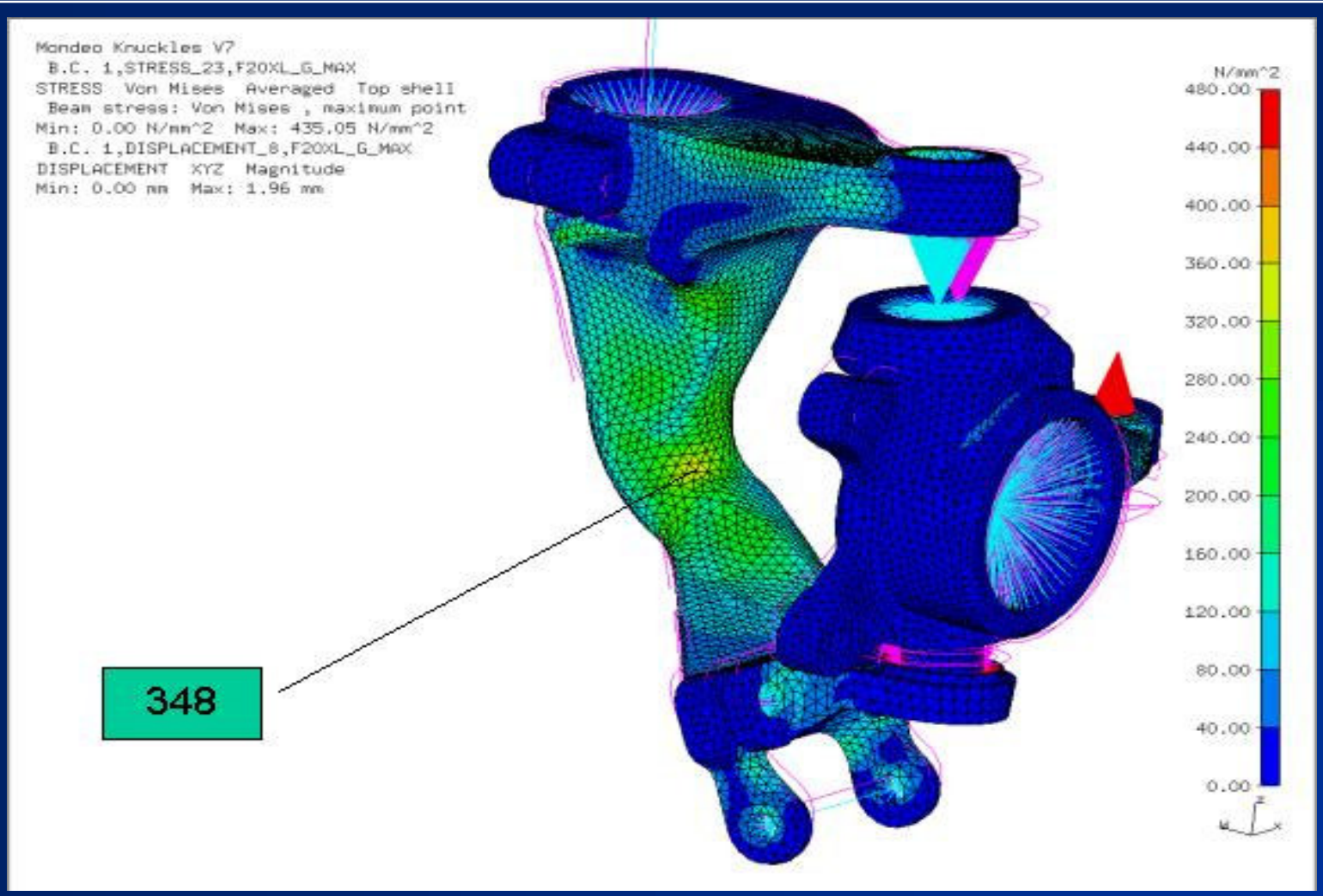


# FEA Results



# Driving Results

Results from Driving Evaluation:

- Significant reduction of “torque steer effect”
- Improved vehicle dynamics performance
- No additional error state
- Promising Concept for front driven high performance vehicles

# End

## Questions