

# The Role of Vehicle Designs in Reducing Noise and Vibration and Improving Wheel Rail Interactions

## Focus Session

Moderated by:  
**Shankar Rajaram | Sound Transit**



RAIL TRANSIT SEMINAR • JUNE 6

**WRI 2023**

# Speakers | Overview

1. **Briony Croft | Acoustics Studio (Sydney, Australia)**
2. **Sergio Perez | Stadler (Valencia, Spain)**
3. **Kevin McClain | Siemens (Sacramento, USA)**
4. **Arne Pfeil | Alstom (Siegen, Germany)**



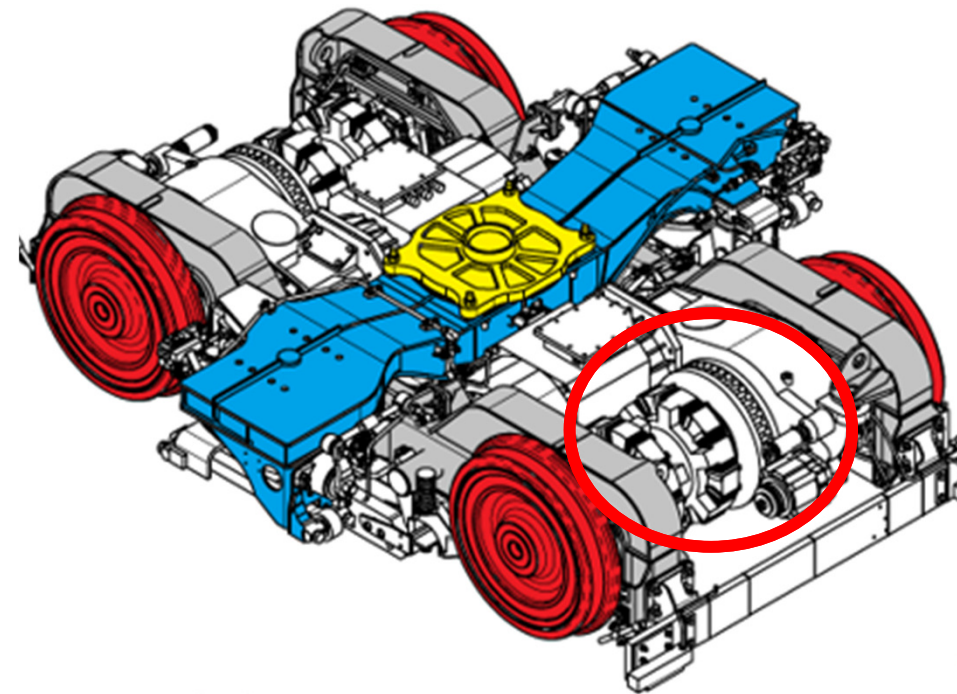
# Optimizing Vehicle Noise and Vibration | Design Challenges

1. Speed performance
2. Steering
3. Stability
4. **Service-proven design**
5. Ease of maintenance

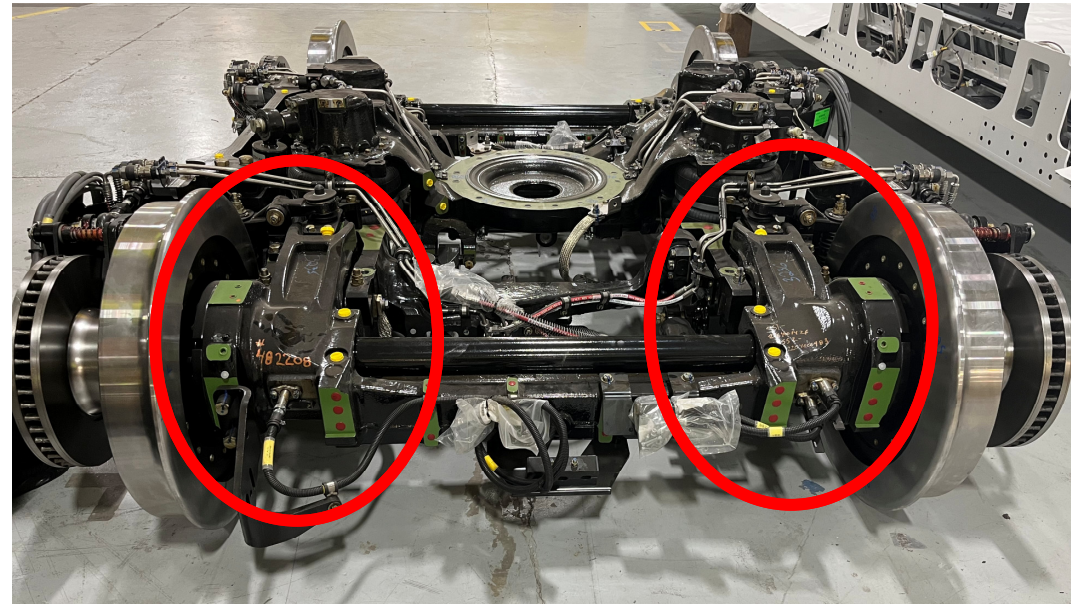


# LRV Design | Truck Performance

Gear on the axle between wheels



Transverse motor arrangement



# Ground Vibration and Noise | Vehicle Design

1. Primary Suspension
2. Resilient Wheels
3. Unsprung Masses
4. Carbody Connections
5. Solid Axle vs Independent Rotating Wheels
6. Wheel Rail Profile Match
7. Wheel Runout & Wheel Flats
8. Surface Roughness

**Vehicle Design**

**Wheel  
Maintenance**



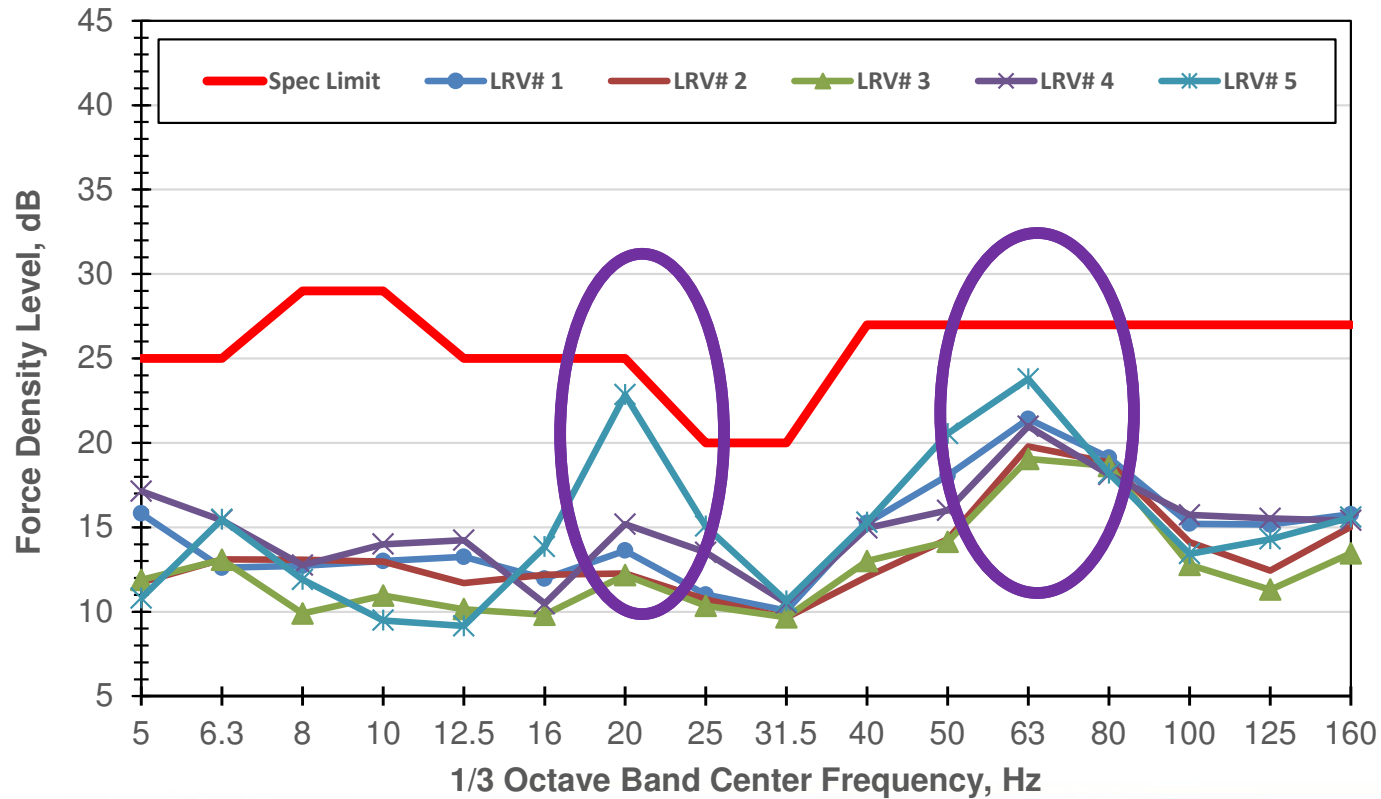
# Vehicle Design | Resilient Wheels



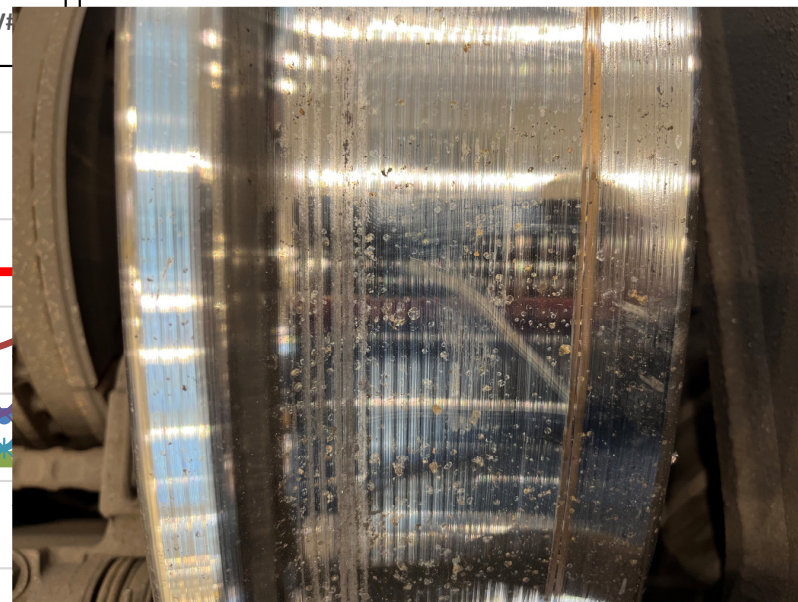
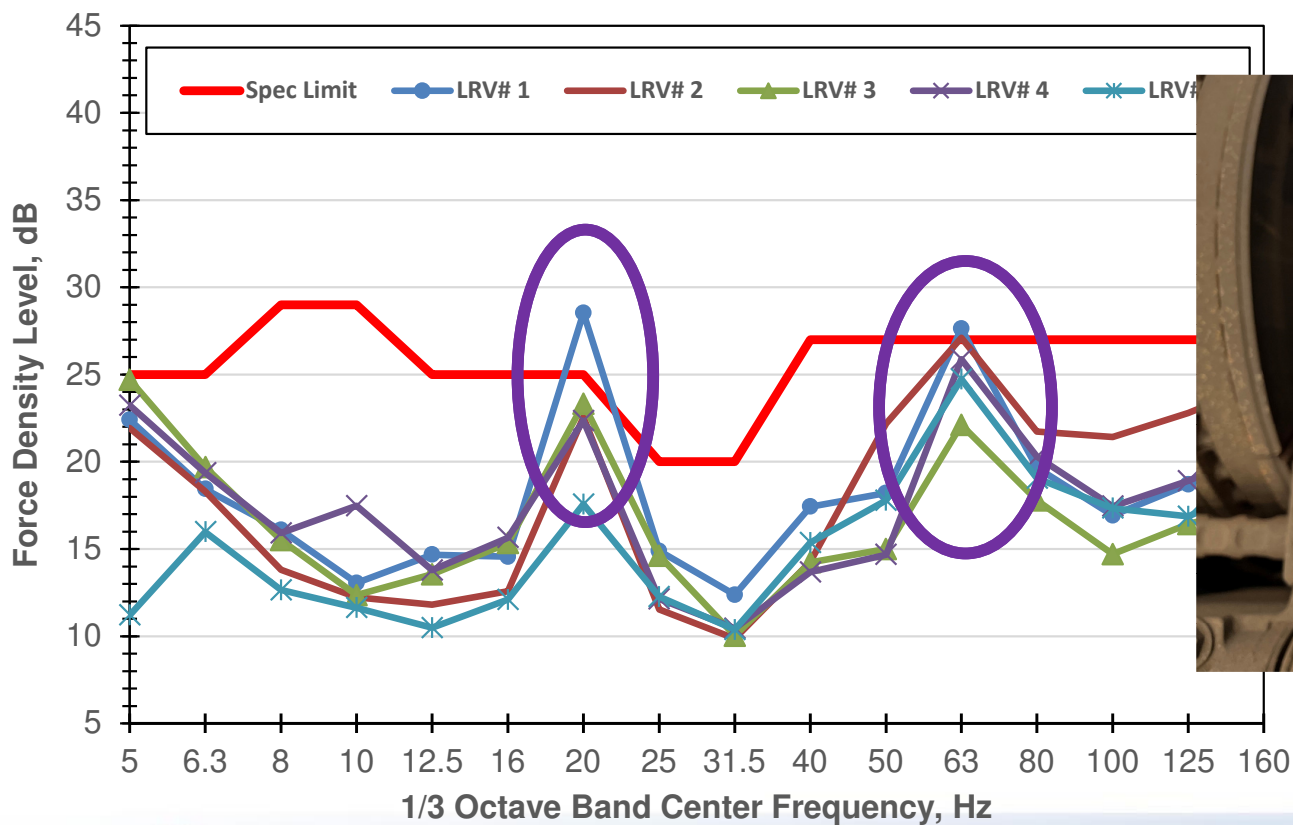
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# Measured Vibration Data | Wheel Condition

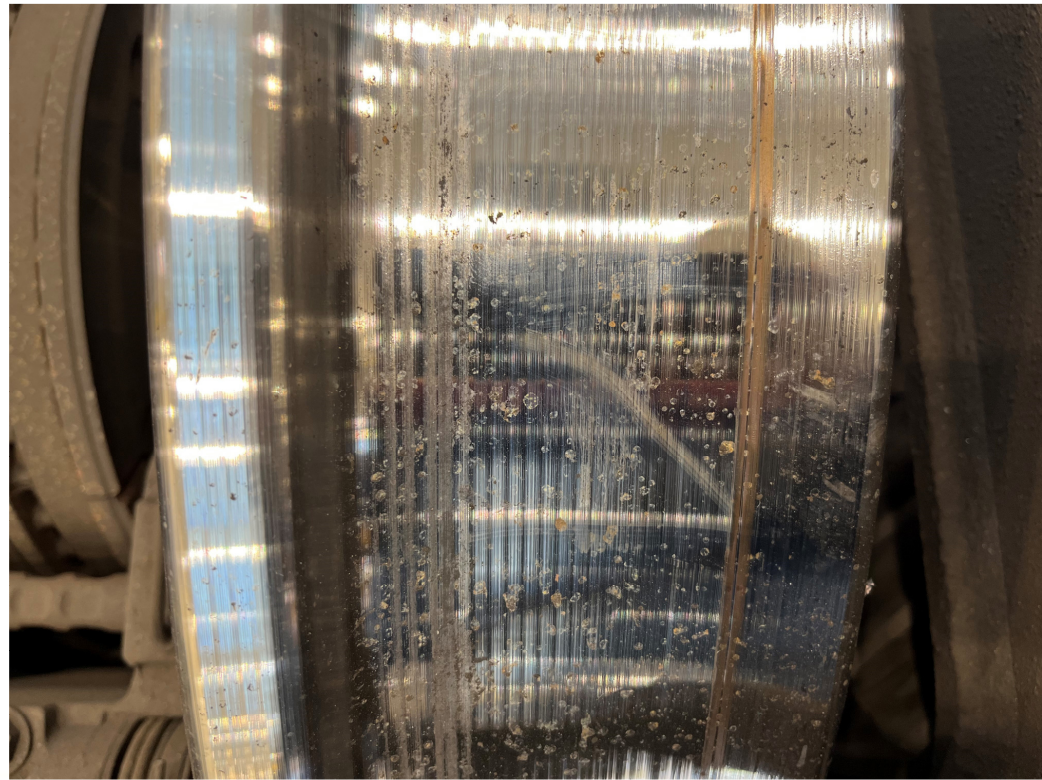


# Measured Vibration Data | Wheel Condition





# Vehicle Design | Wheel Surface Finish



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