



INTERNATIONAL  
ELECTRIC VEHICLE SYMPOSIUM & EXHIBITION



# Silencing the Future – A System Level Approach to NVH Reduction

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**EVS32**  
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2019 MAY  
19-22

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Source: <https://www.assemblymag.com>

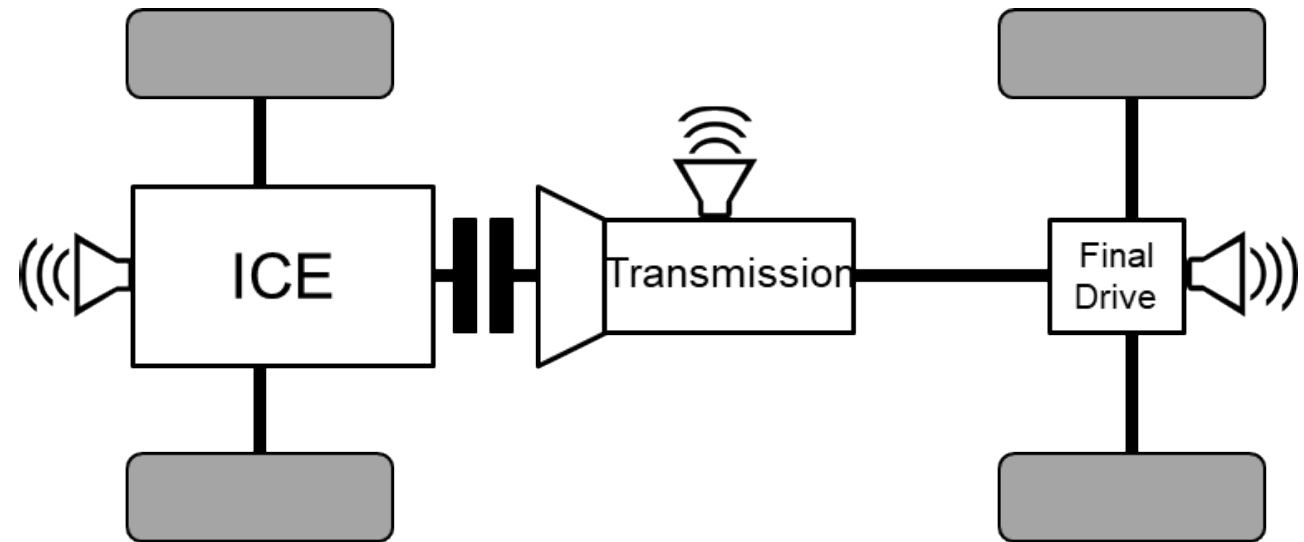


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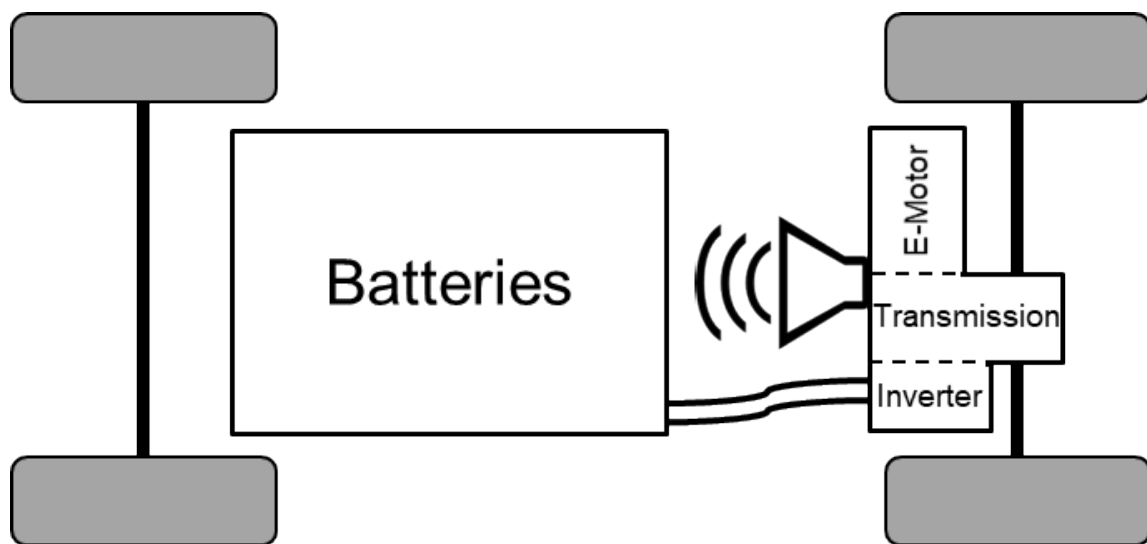
**EXPECT  
DELAYS**

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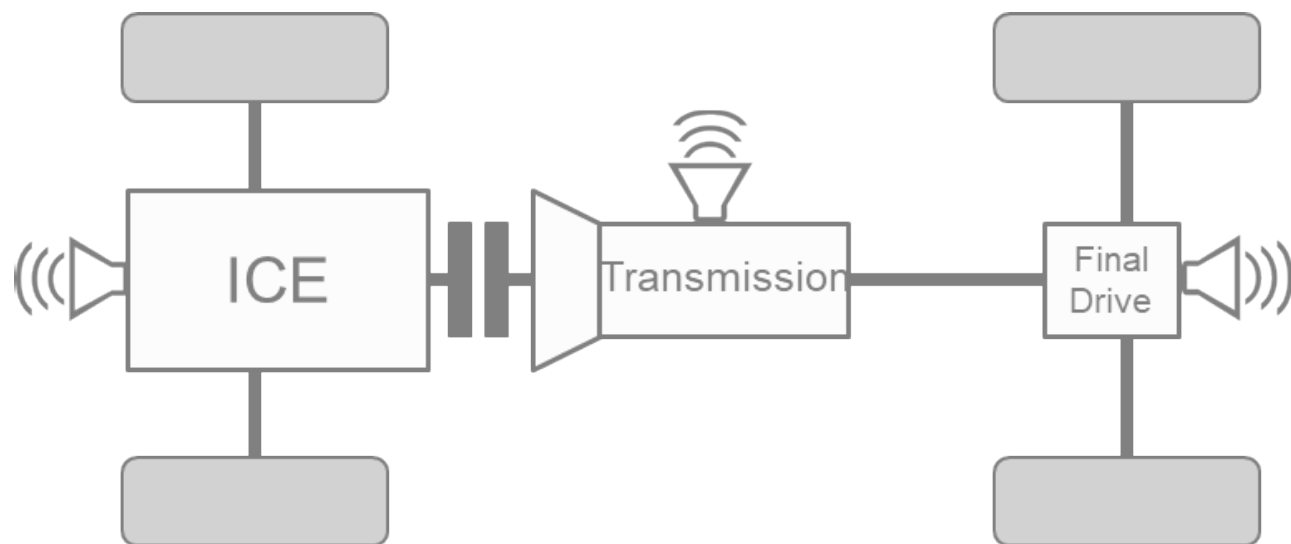
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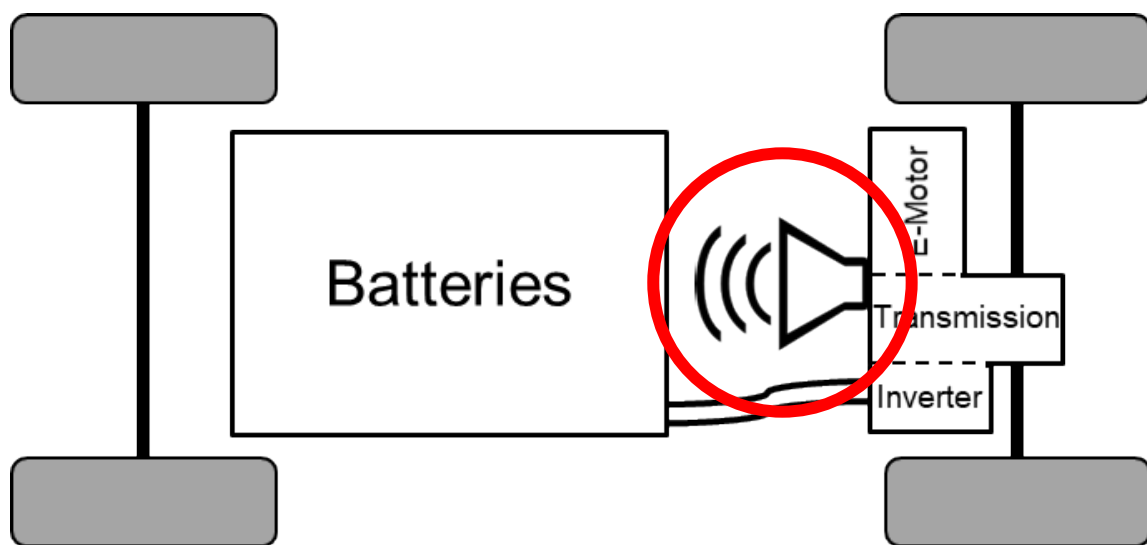
Typical ICE Powertrain



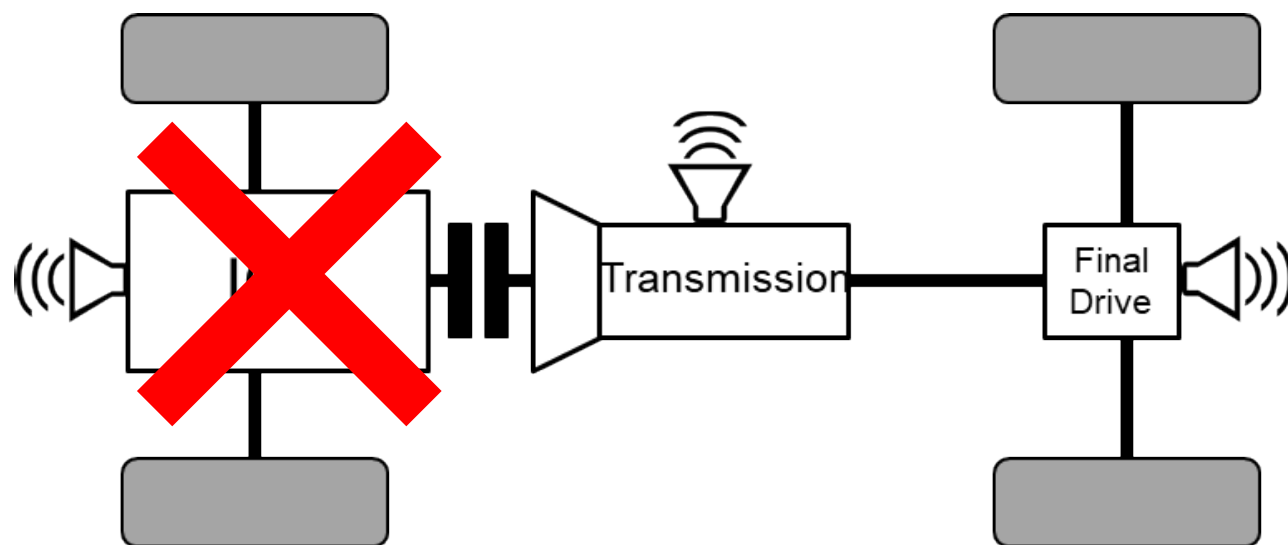
Typical EV Powertrain



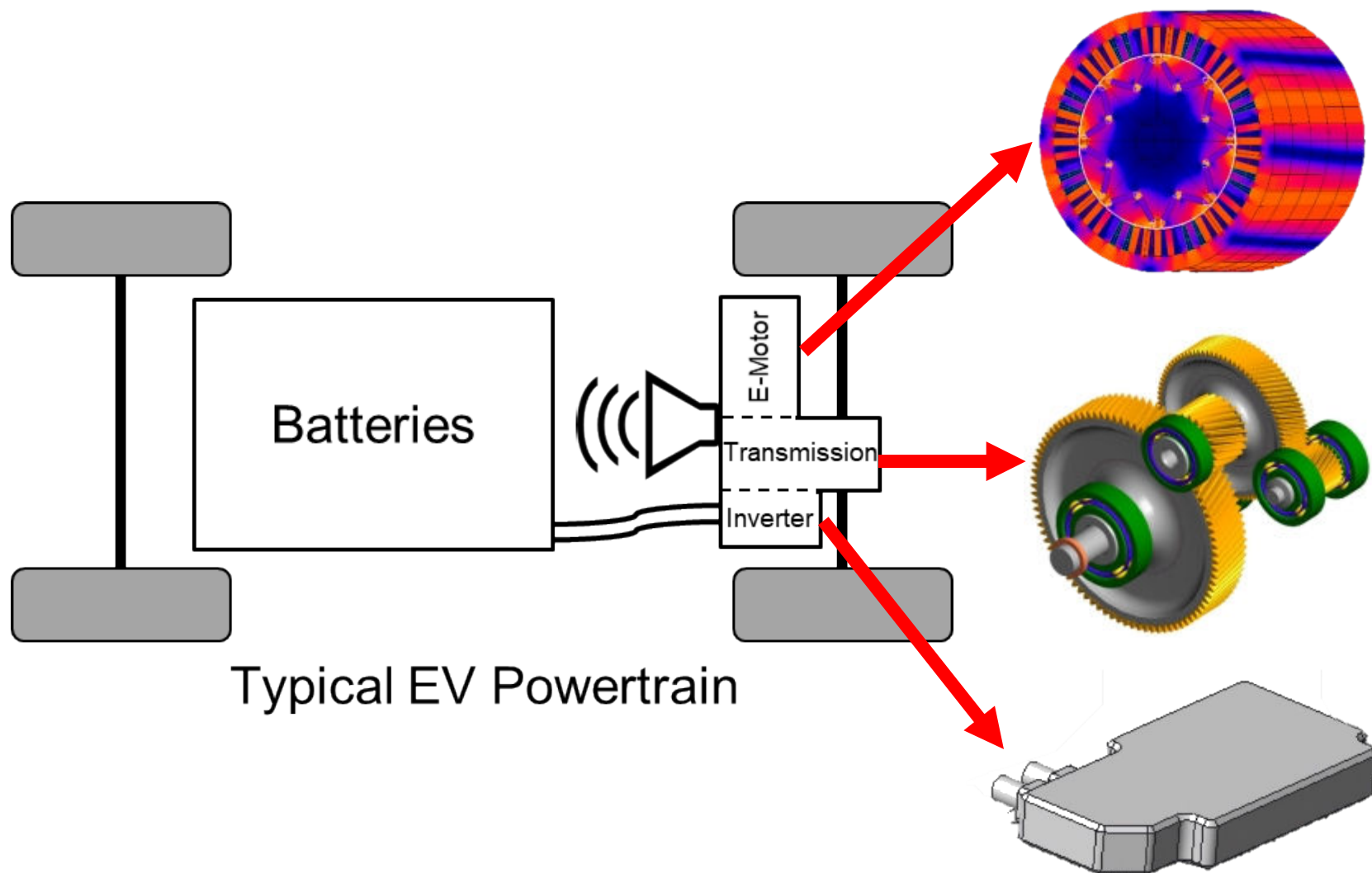
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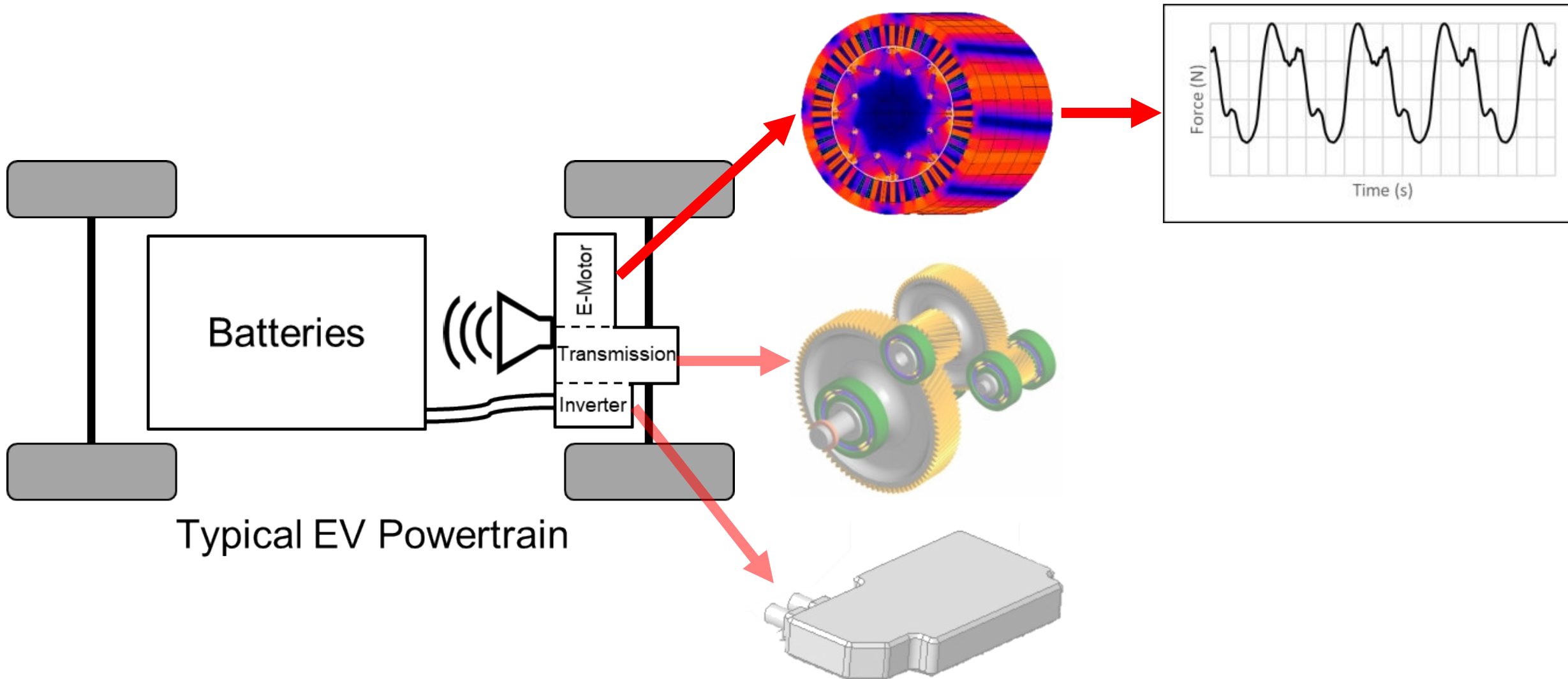
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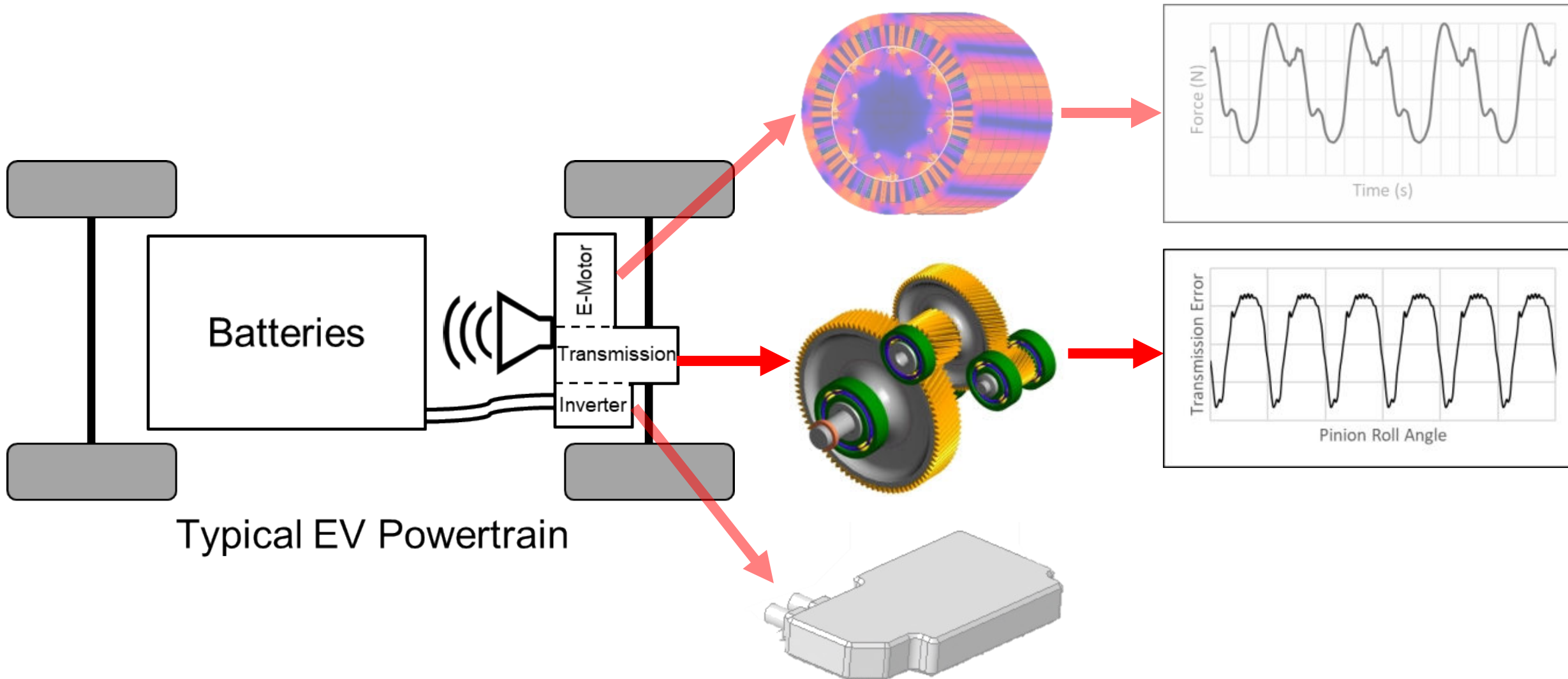


Typical ICE Powertrain

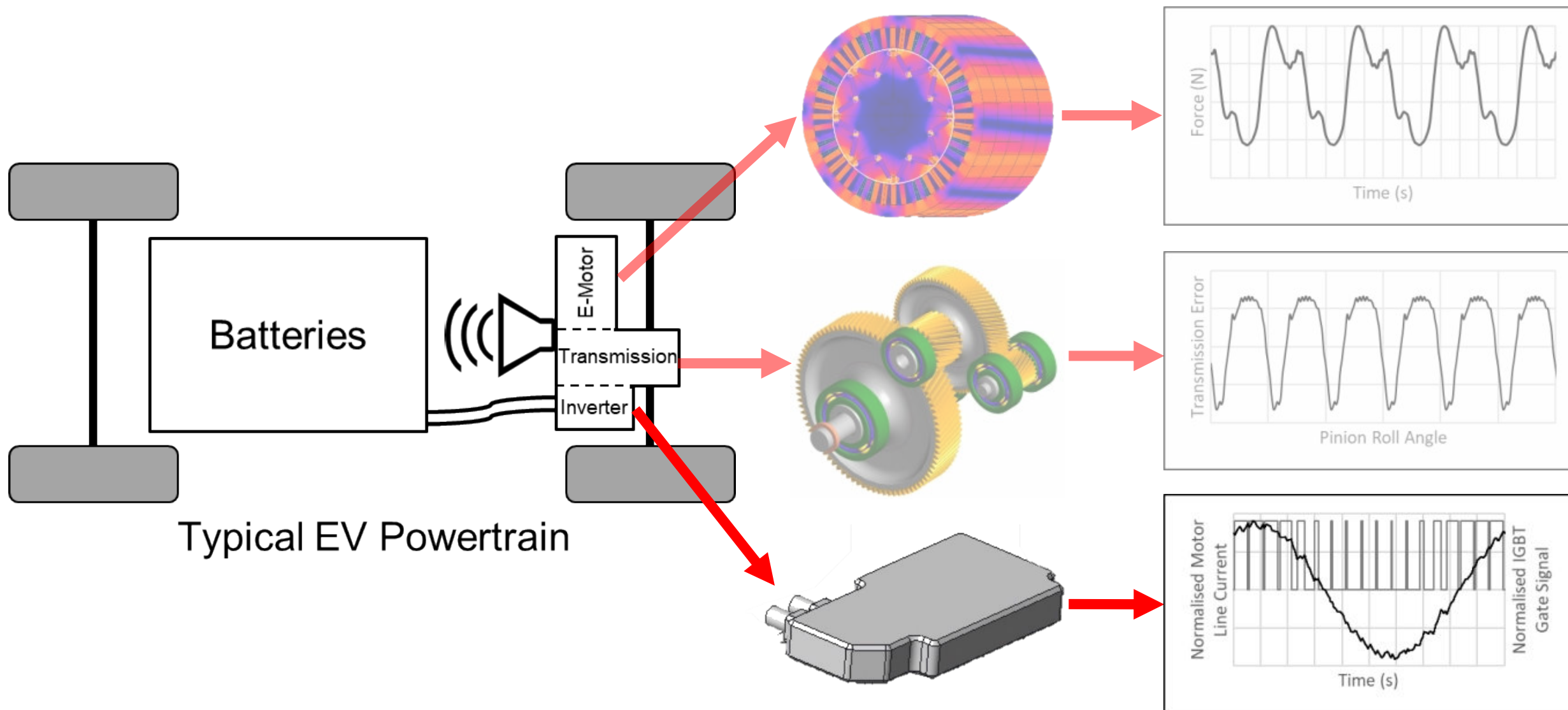


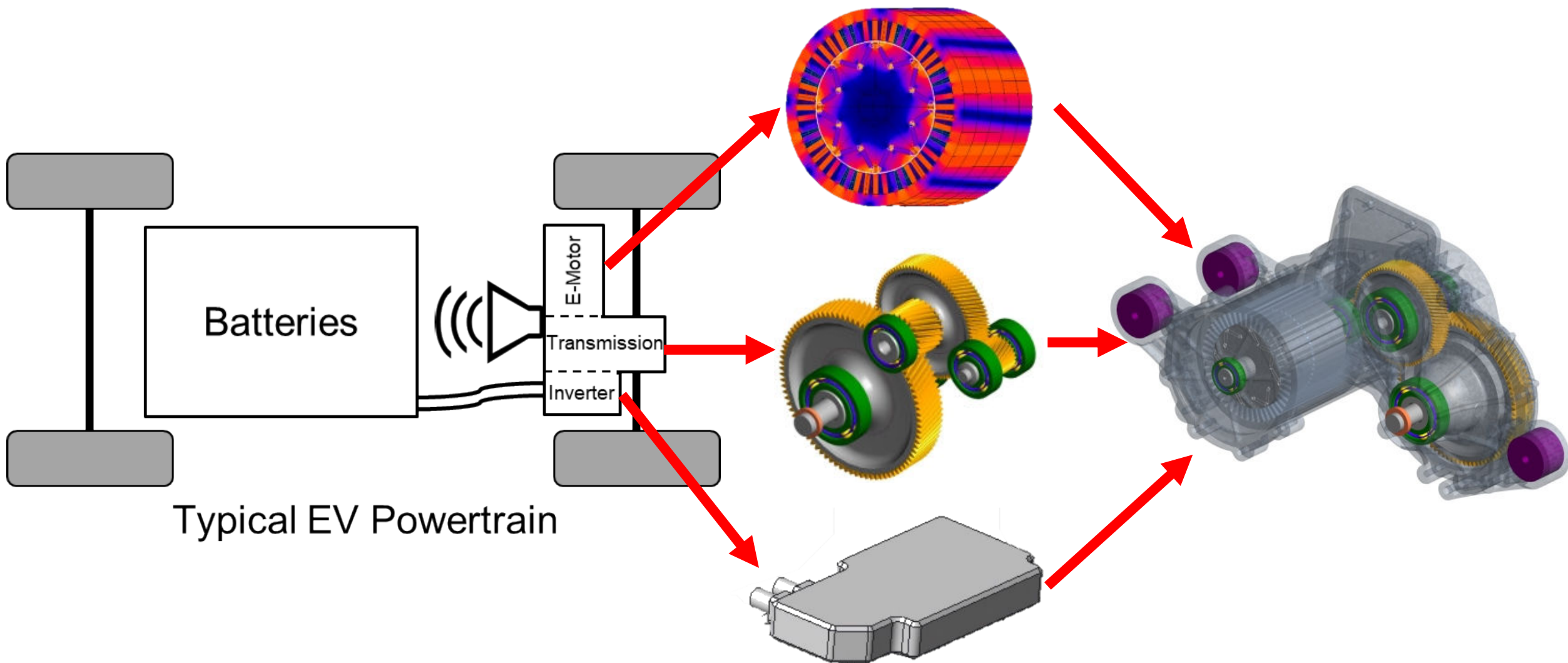




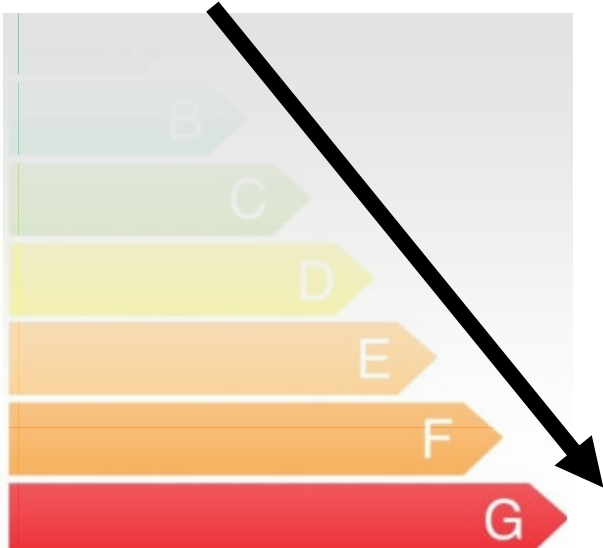








## Reduced Efficiency



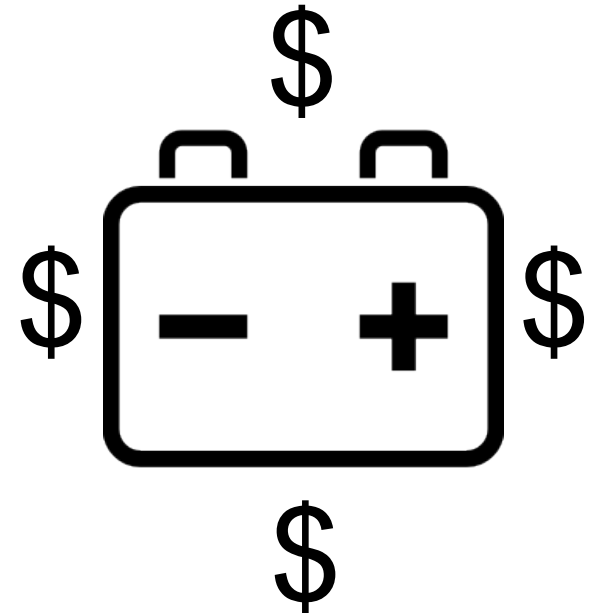
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## Reduced Range

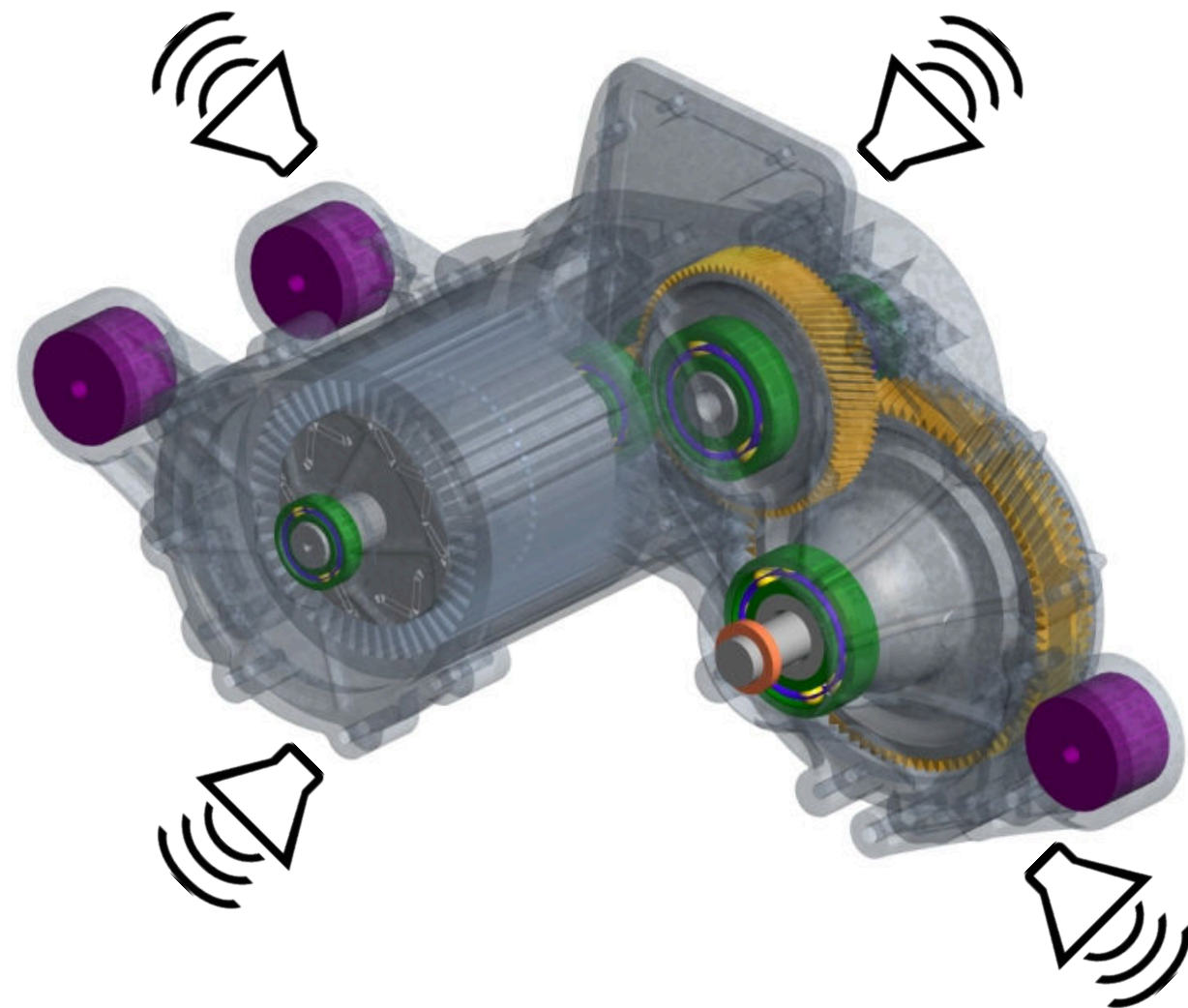
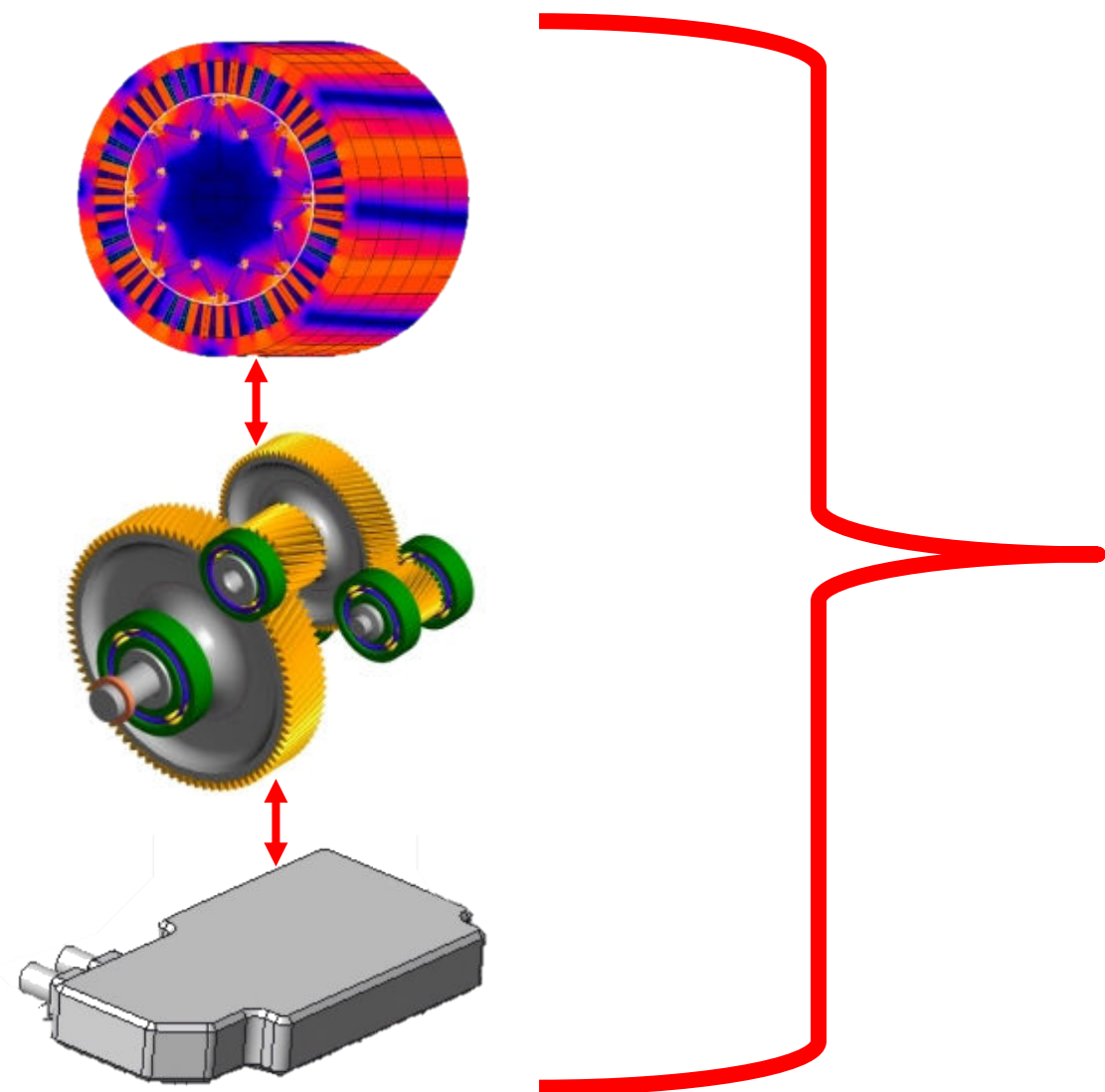


OR

## Increased Battery cost

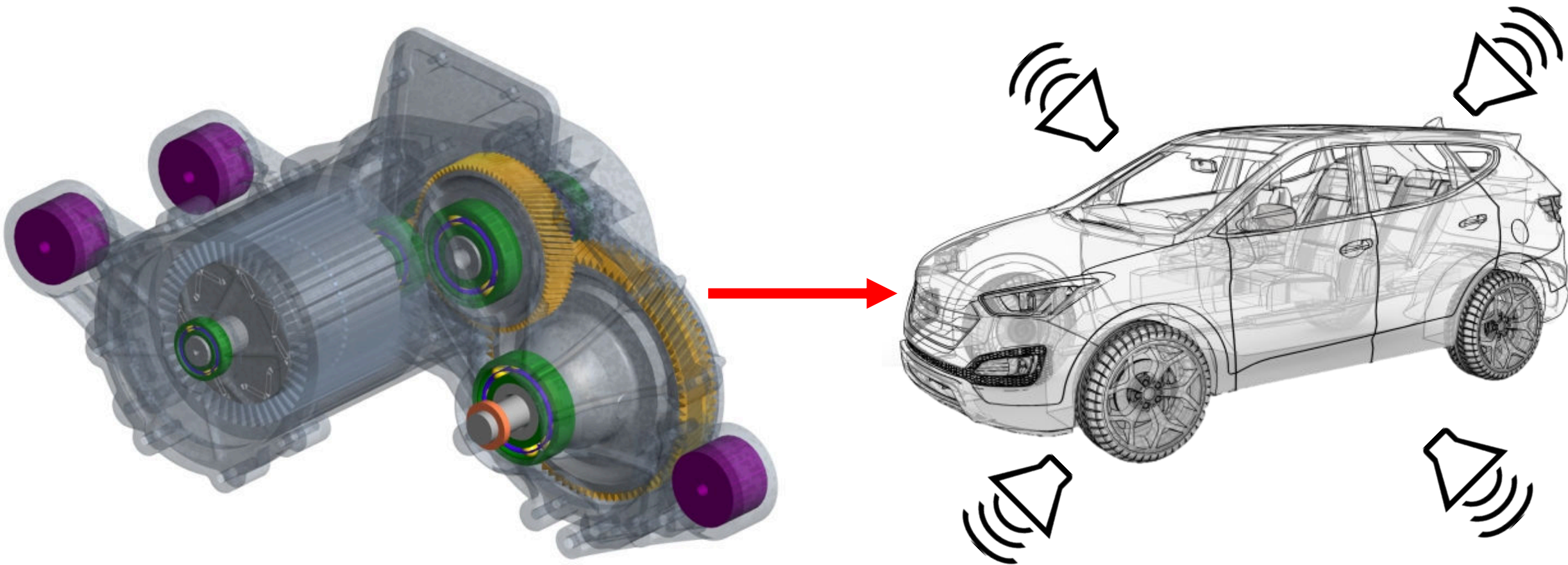






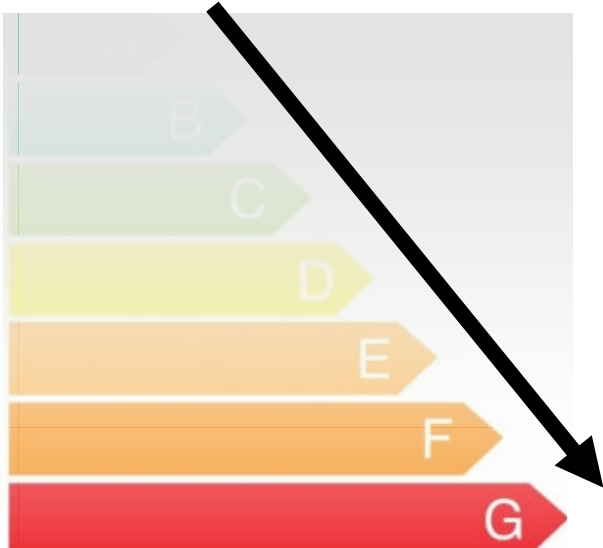
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## Reduced Efficiency



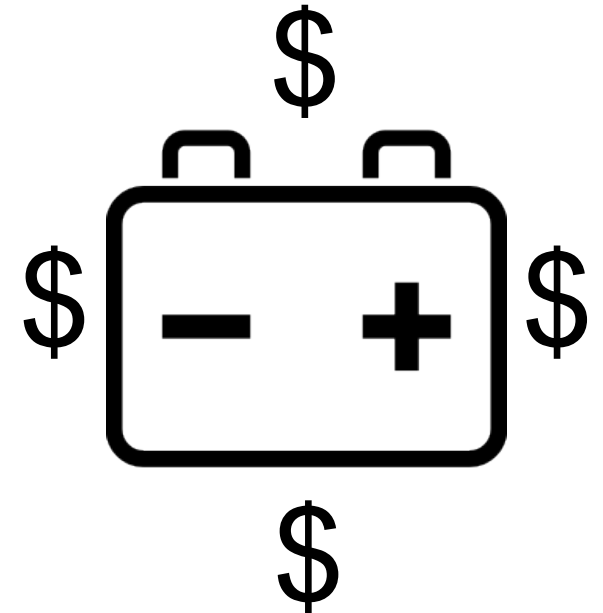
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## Reduced Range



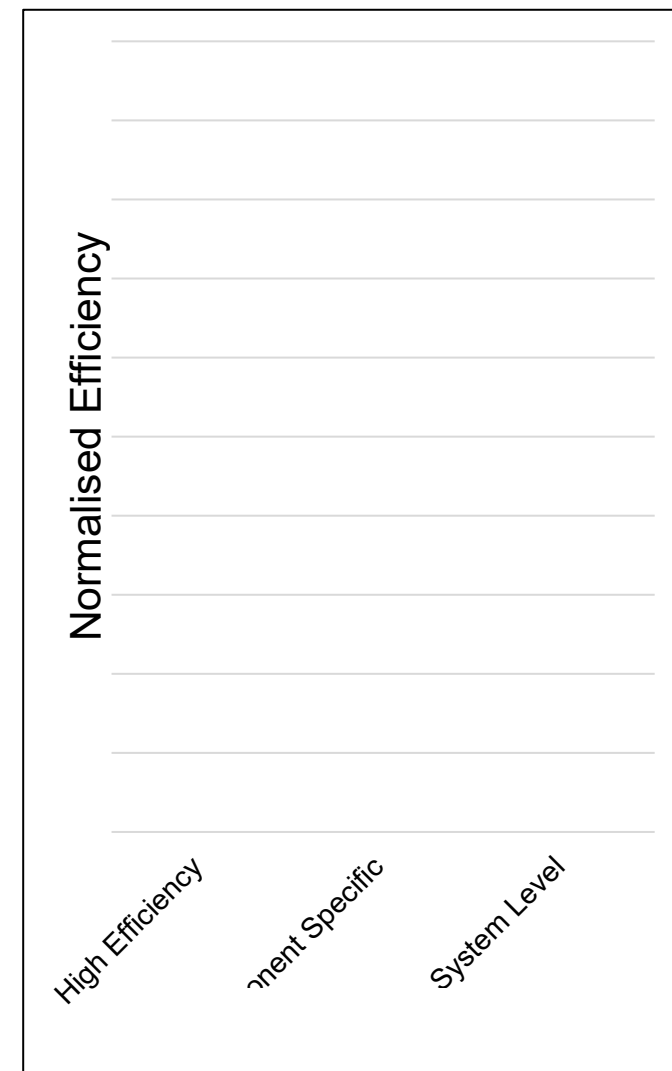
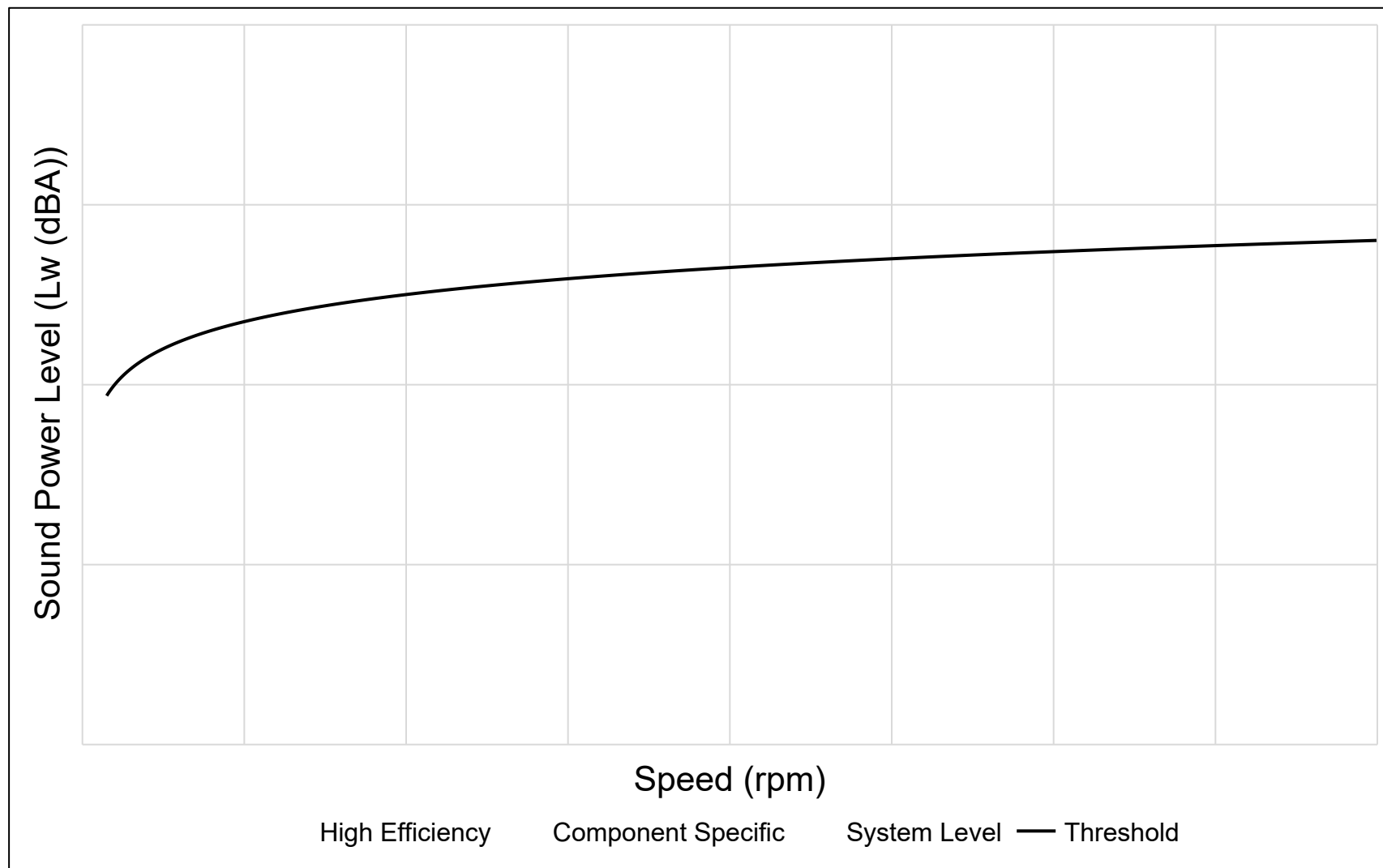
OR

## Increased Battery cost

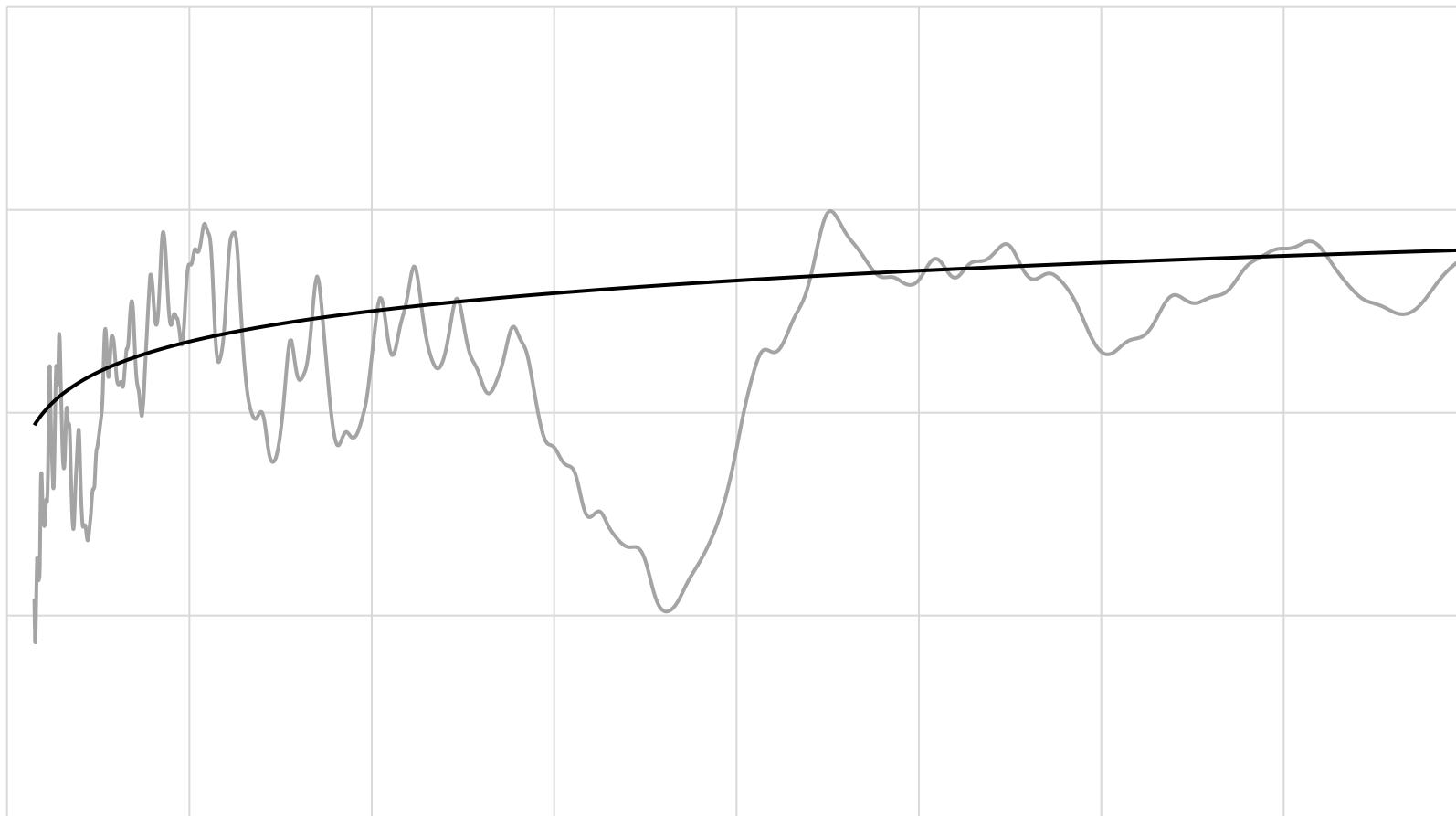




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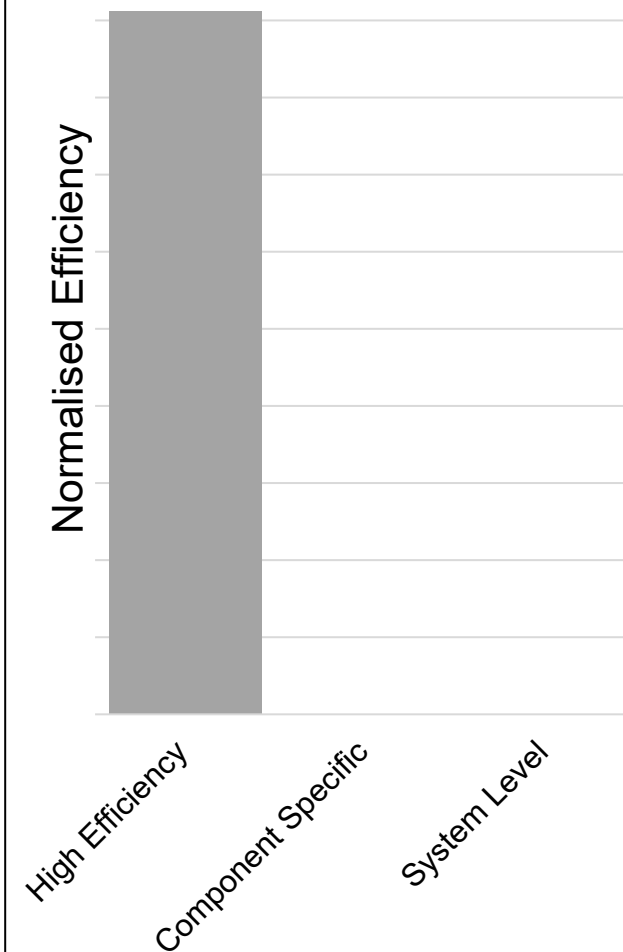


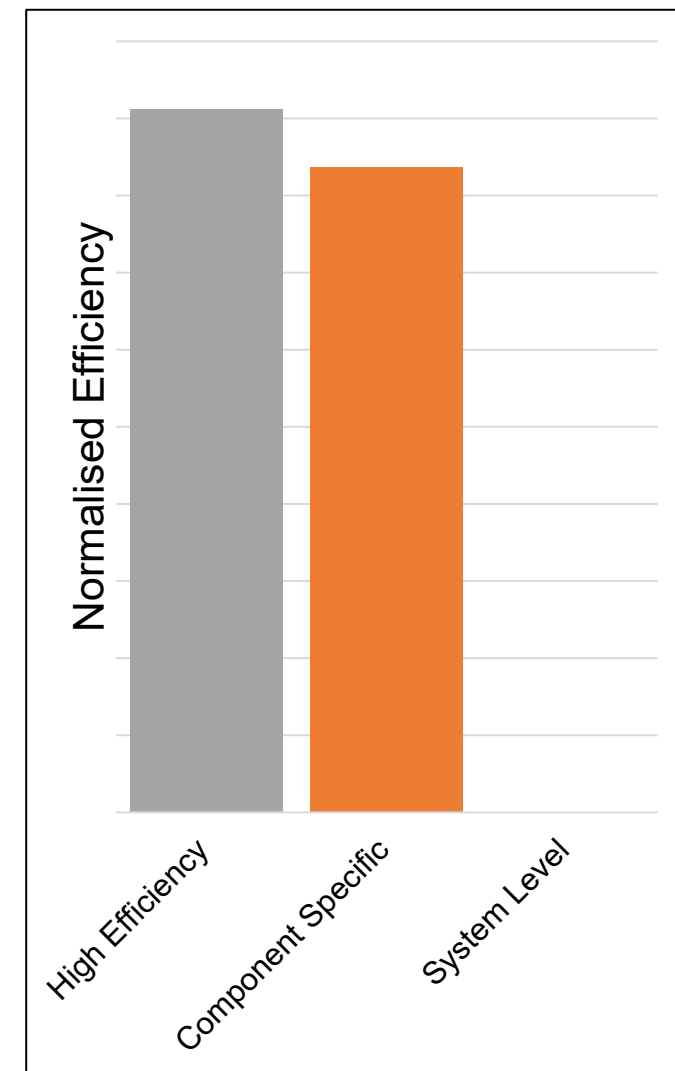
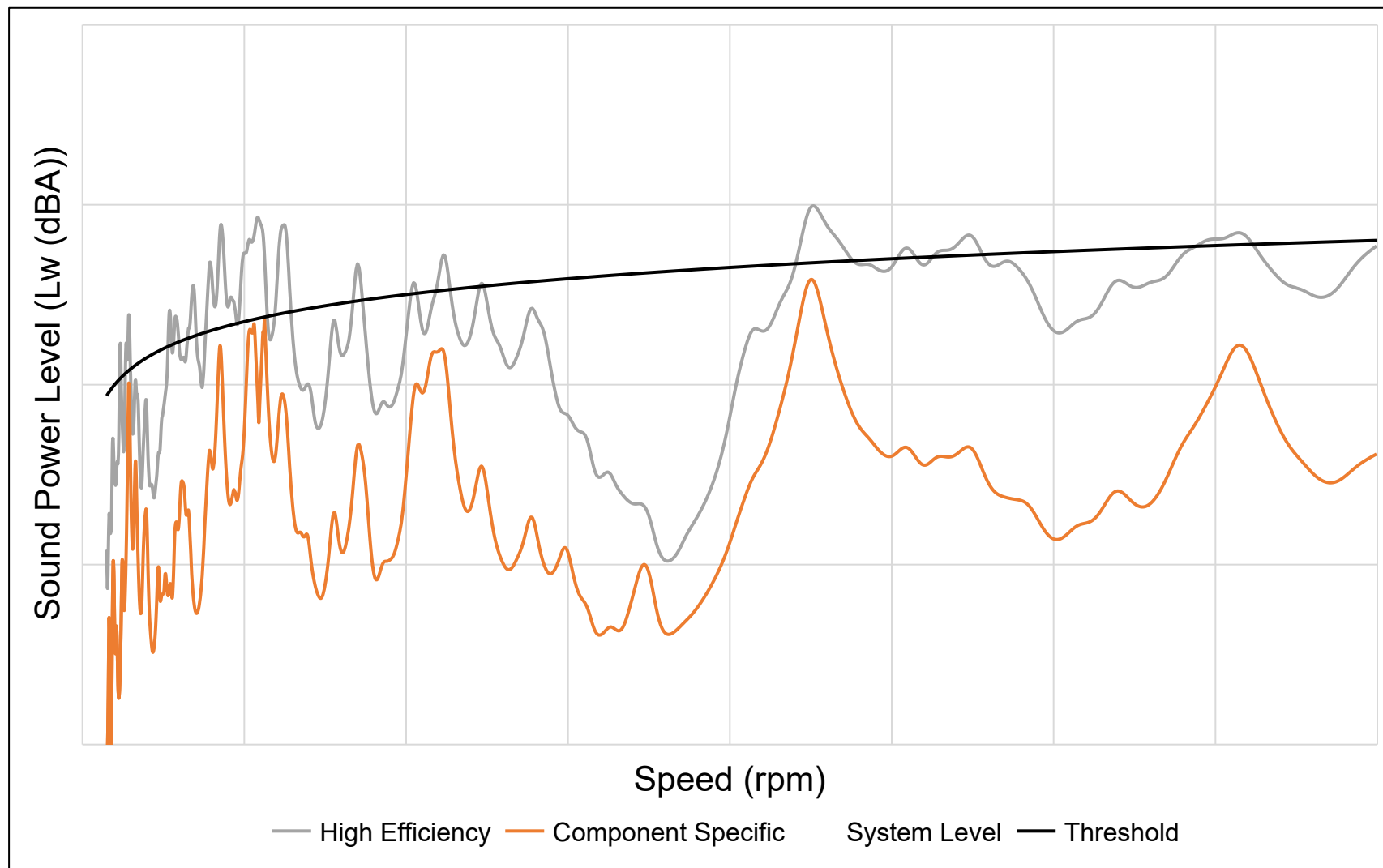
Sound Power Level (L<sub>w</sub> (dBA))



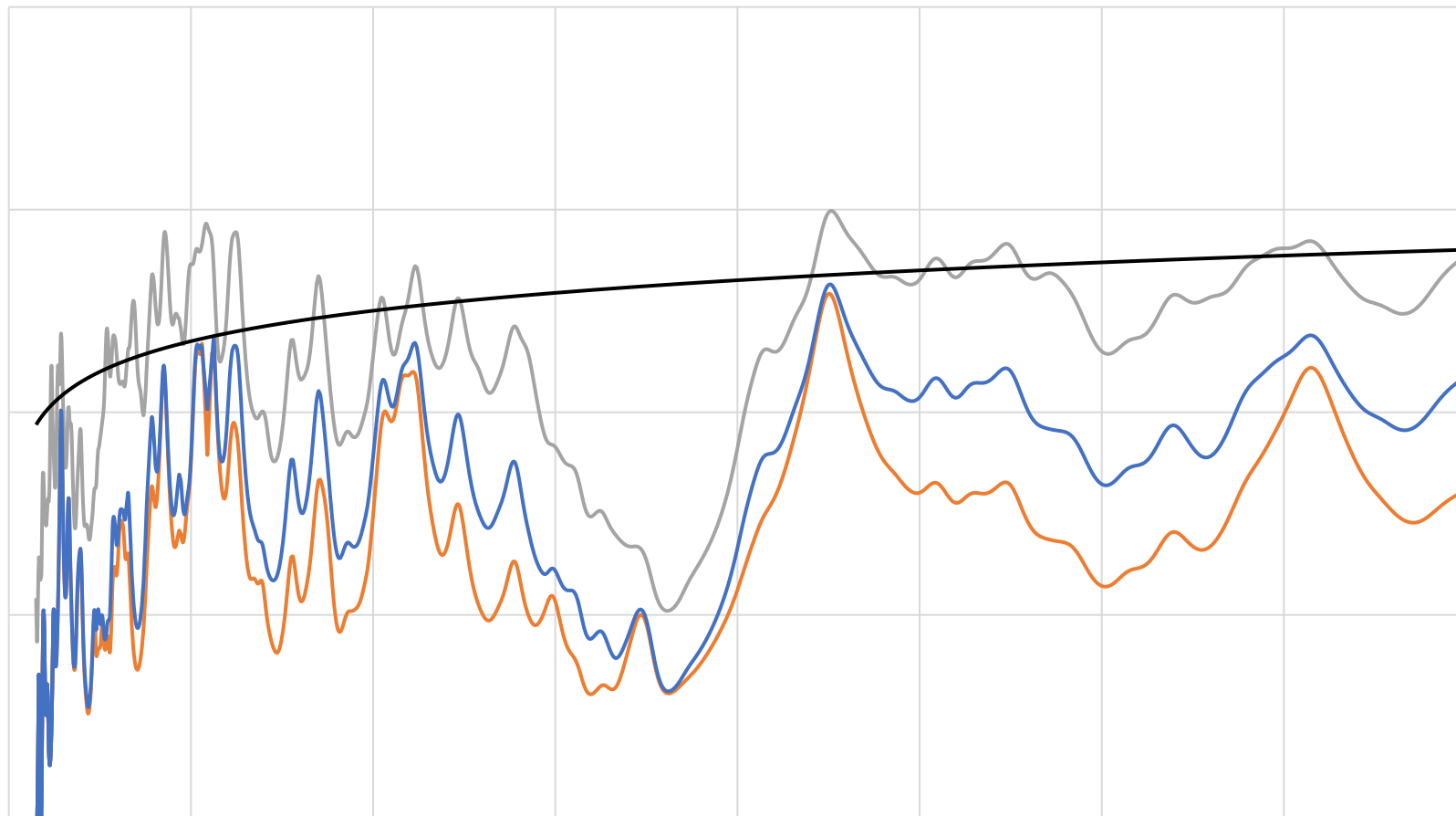
— High Efficiency    Component Specific    System Level    — Threshold

Normalised Efficiency



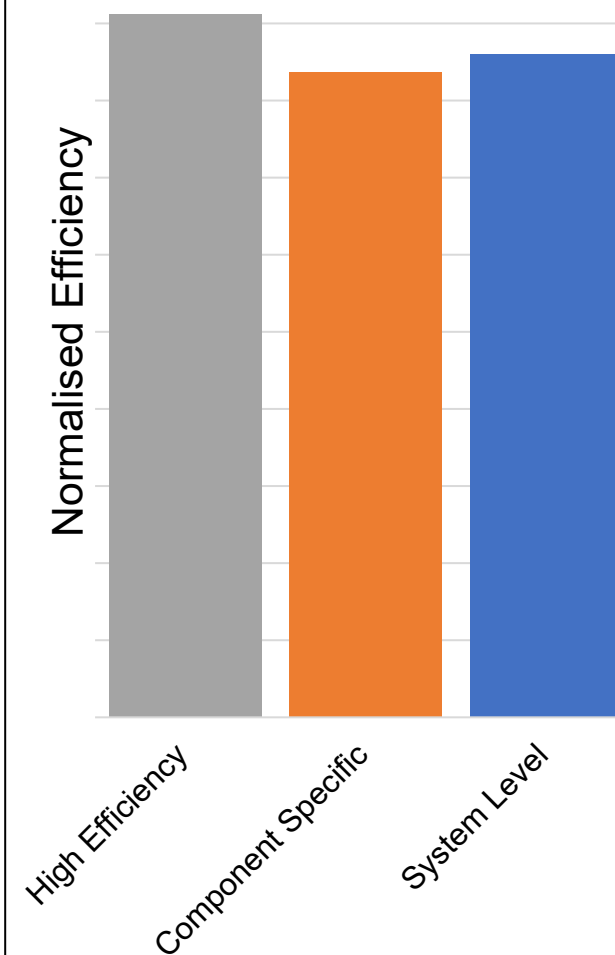


Sound Power Level (Lw (dBA))

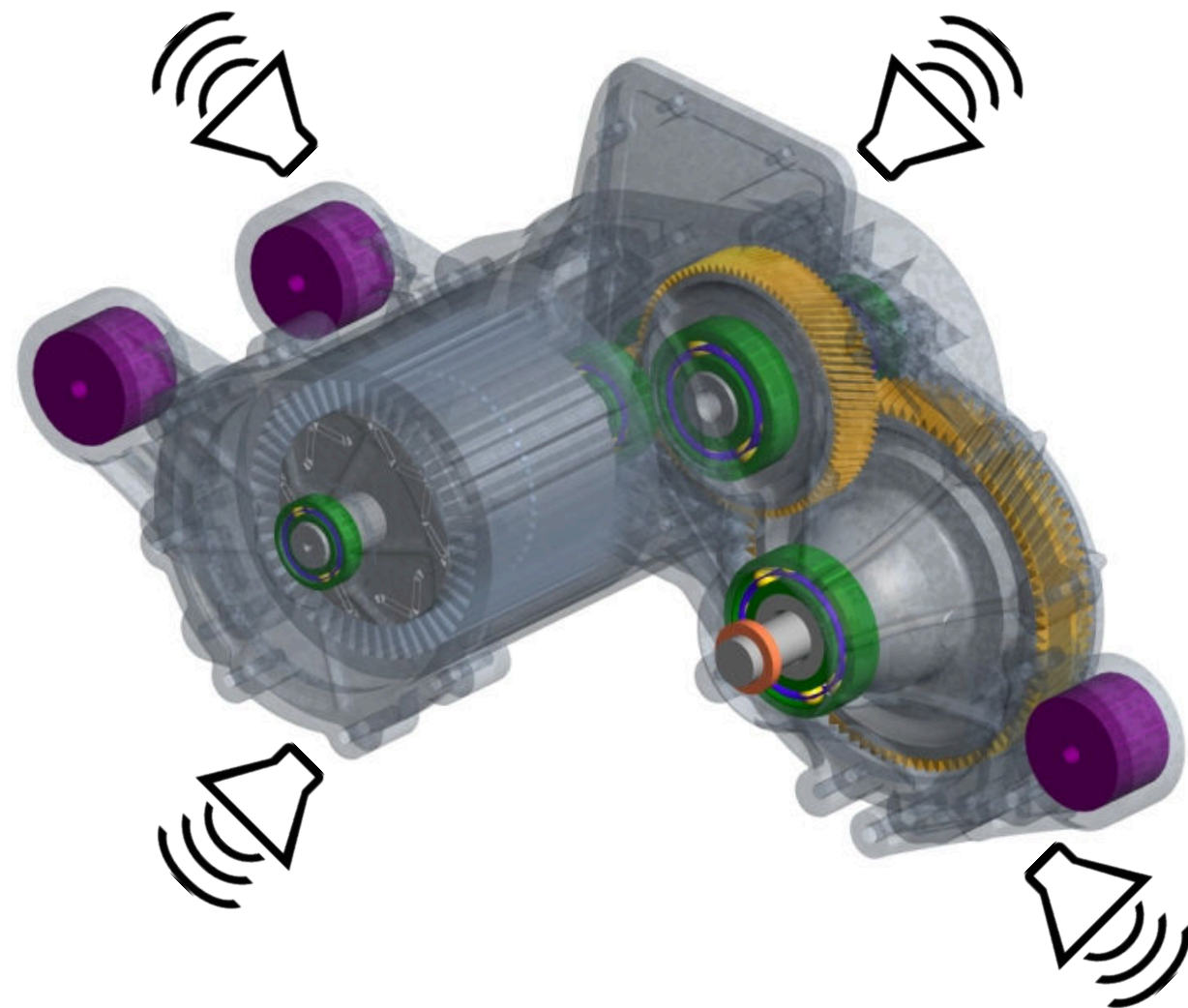
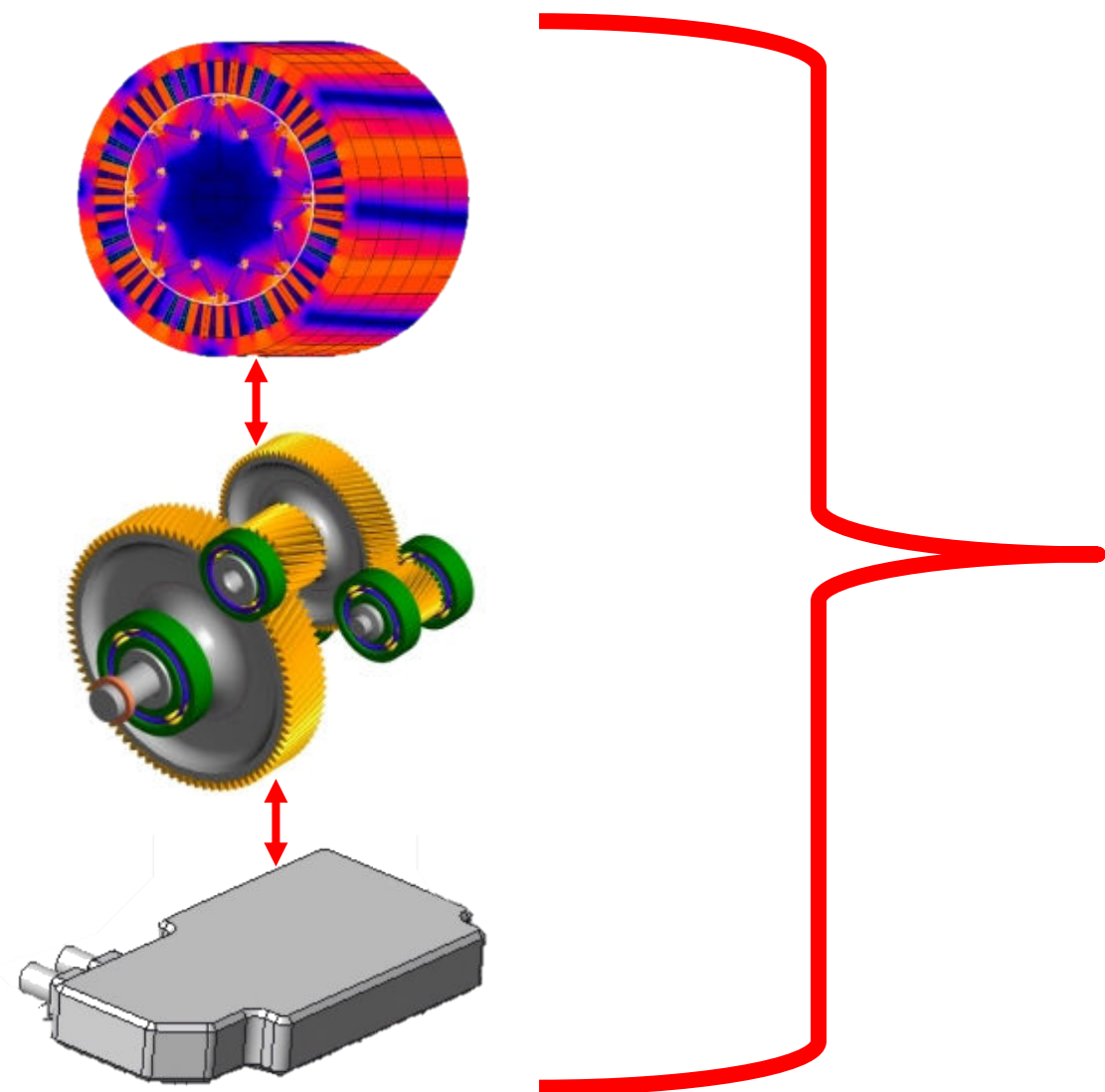


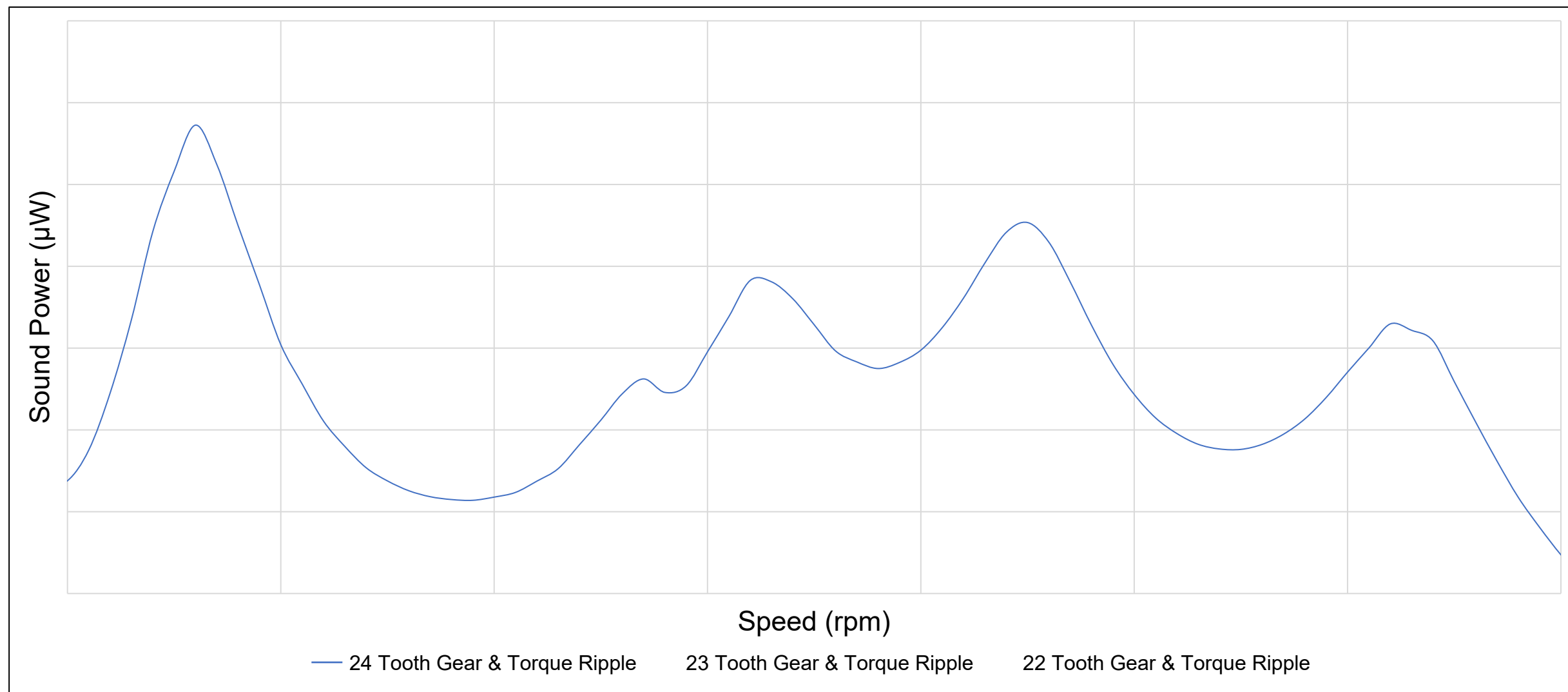
— High Efficiency — Component Specific — System Level — Threshold

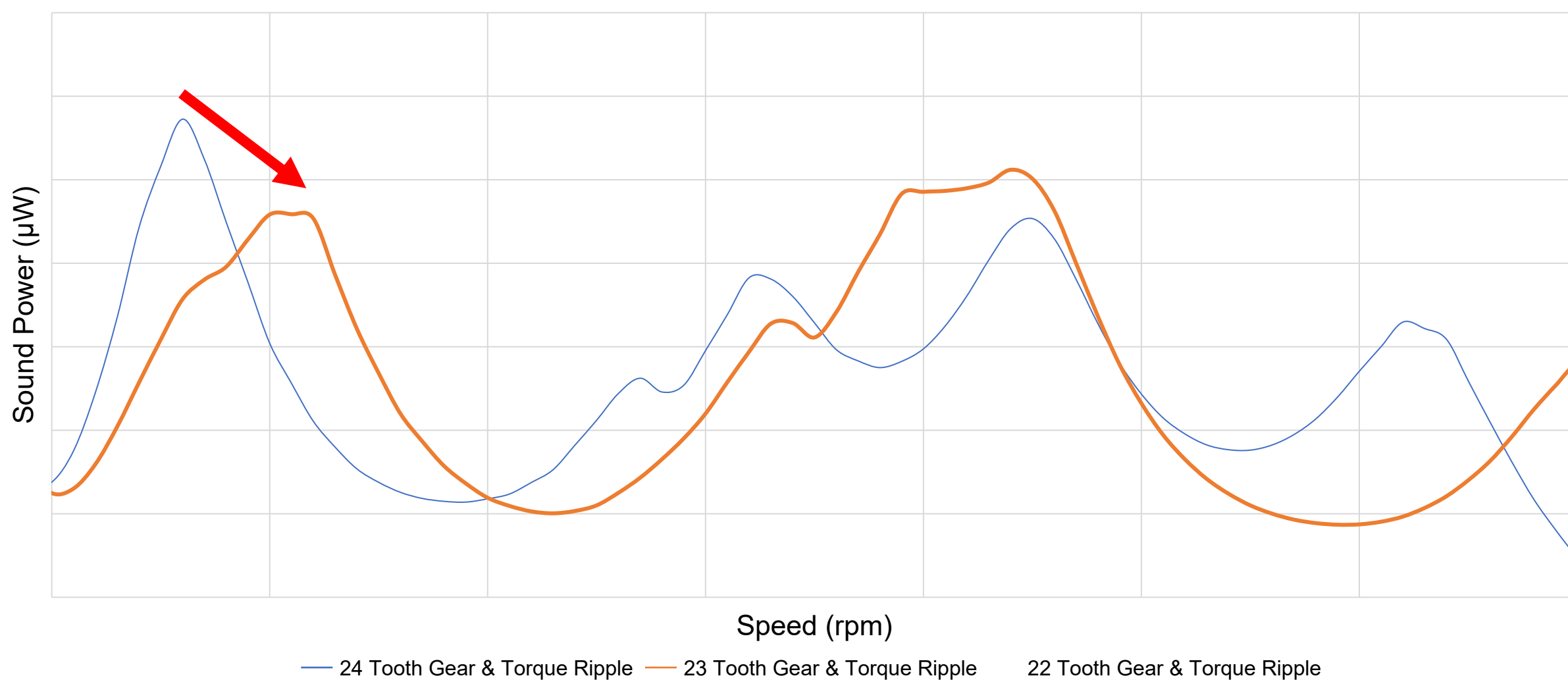
Normalised Efficiency

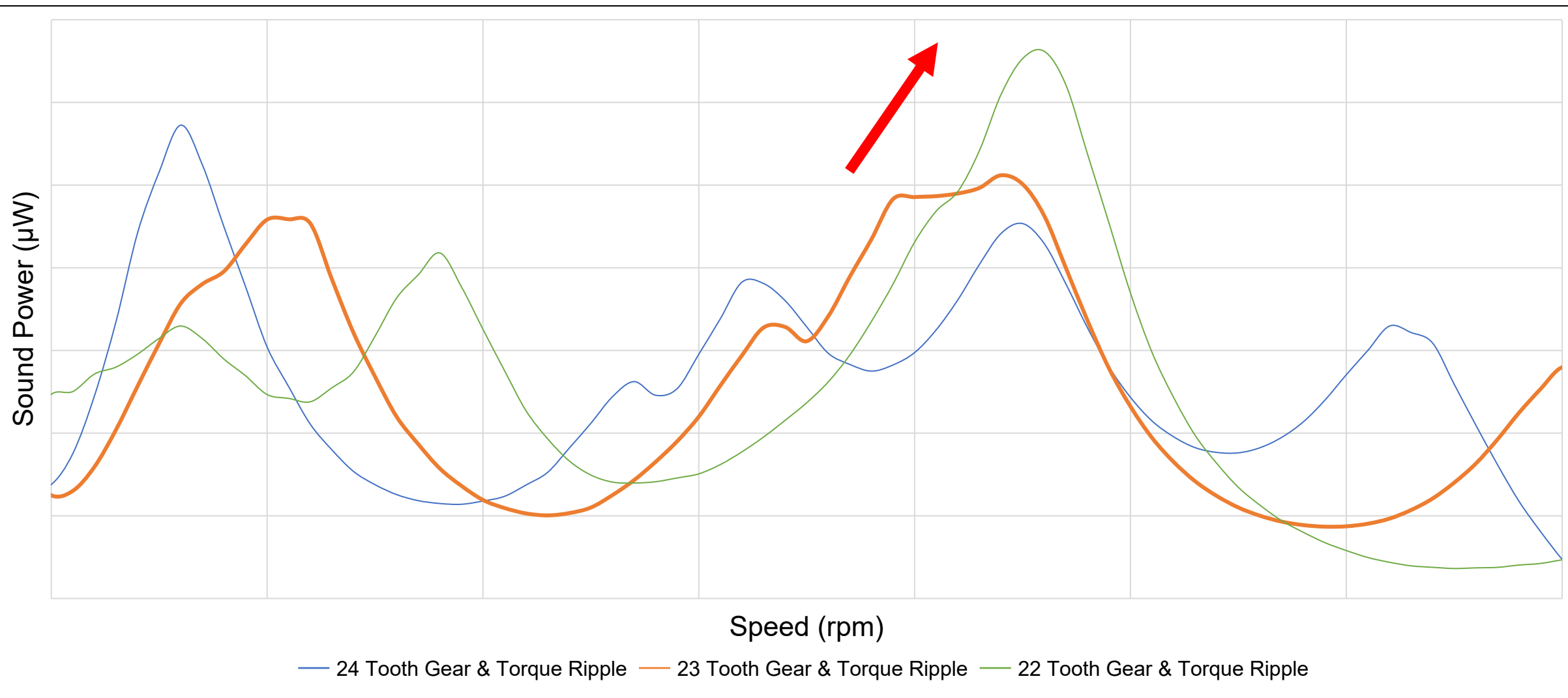








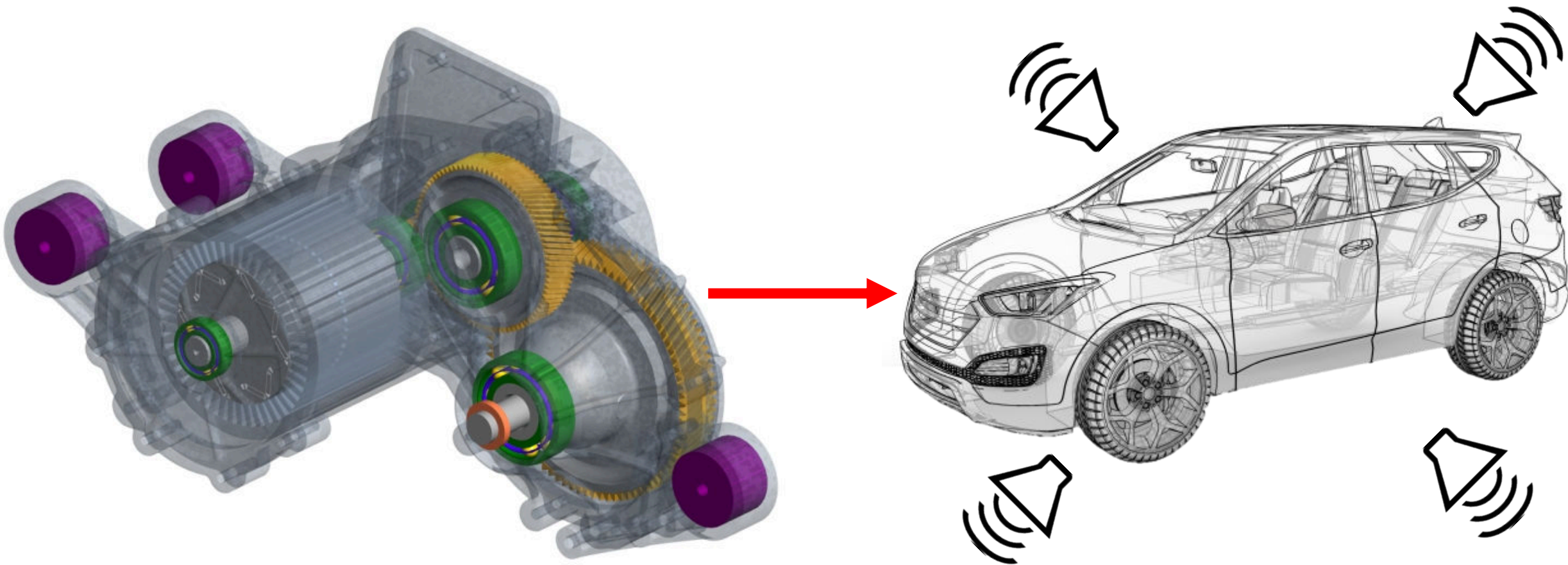




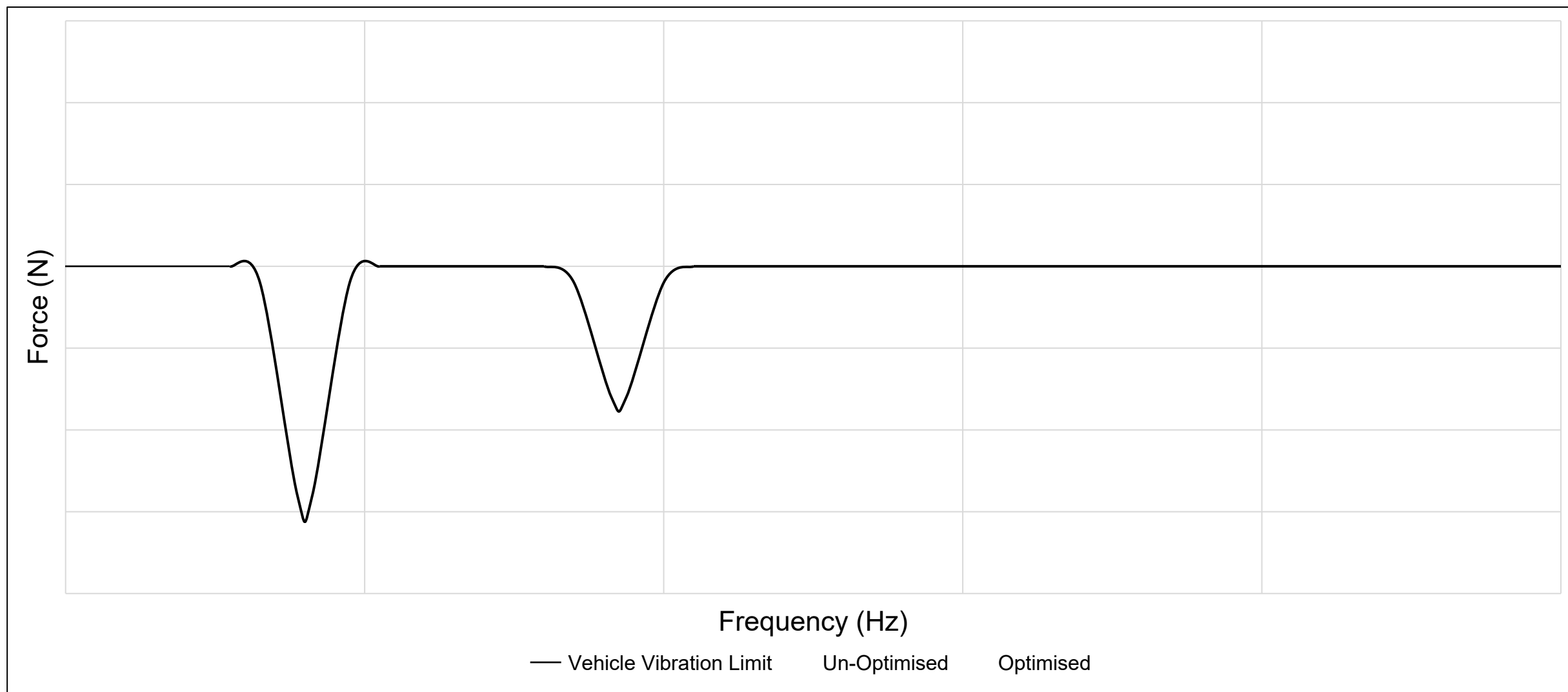


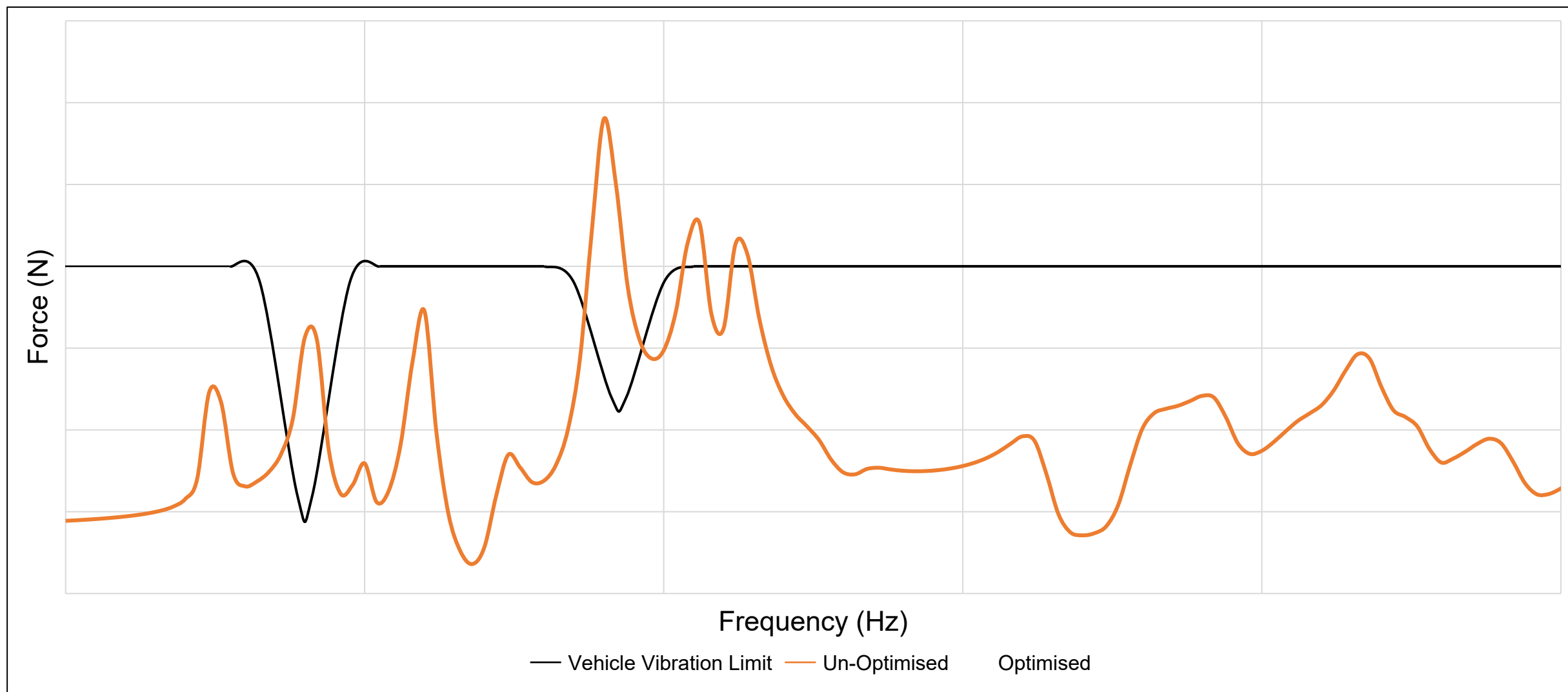
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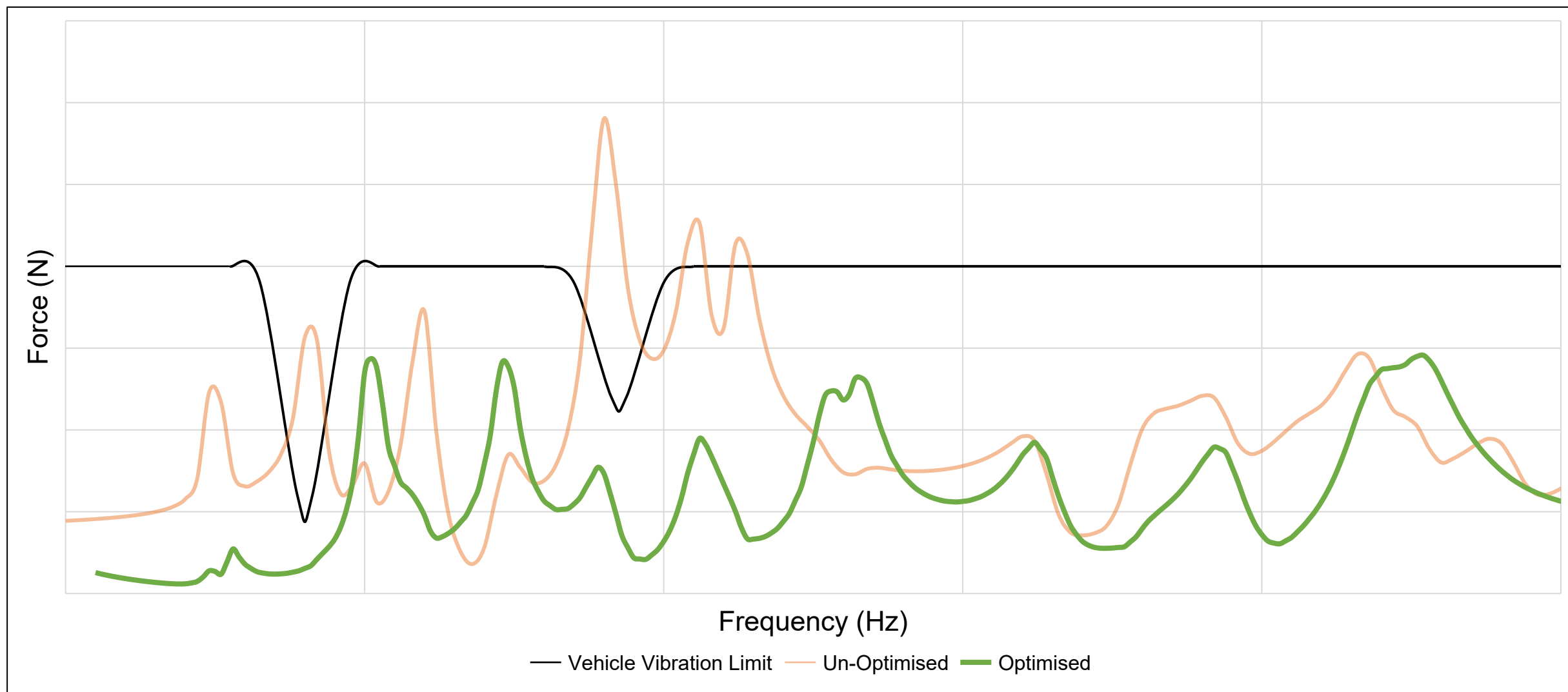
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# System Level NVH Analysis Approach

- Realise efficiency benefits
  - Increase vehicle range or reduce battery costs
- Understand component and vehicle interactions
  - Avoid late emerging NVH issues
  - Avoid inefficient and costly compromises
  - Avoid costly delays to vehicle programs



Come see us at  
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**NO  
DELAYS**