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(R) Definition and Measurement of Torque Biasing Differentials

RATIONALE

This document is being updated to include all types of differentials and to include lessons learned from recent test developments completed in late 2014.

1. SCOPE

This SAE Recommended Practice covers passive torque biasing axle and center differentials used in passenger car and light truck applications. Differentials are of the bevel gear, helical gear, and planetary types, although other configurations are possible.

1.1 Purpose

To provide a common means to define, measure, and quantify the operating characteristics of torque biasing for all differentials.

2. REFERENCES

There are no referenced publications specified herein.

3. DEFINITIONS

3.1 TORQUE BIAS RATIO

Given a differential where one full turn of a first output shaft results in one full turn in the opposite direction of a second output shaft (1:-1 ratio across outputs):

Torque bias ratio is defined as the ratio of the output torques when differentiating under load.

$$\text{Torque Bias Ratio (TBR)} = \text{Torque High}/\text{Torque Low} \quad \text{(Expressed as N:1)} \qquad \text{(Eq. 1)}$$

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