



SURFACE VEHICLE STANDARD

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(R) Tire Size Differential - Articulated Wheel Loader

RATIONALE

This SAE Standard applies to the usage of tires of the same nominal size and tread type, but with different outside diameter for articulated front-end loaders. Articulated four-wheel-drive front-end loader performance and component life can be affected by excessive differences in the tire outside circumference and/or diameter. The purpose is to provide specific guidelines for the usage of tires with different outside circumference and/or diameter on articulated front-end loaders. Such guidelines for tire circumferences/diameters on the axle positions are stated as within the specified variances.

FOREWORD

This document has not changed other than to put it into the new SAE Technical Standards Board Format. The guidelines for tire matching on the axle positions have been clarified.

1. SCOPE

This SAE Standard applies to the usage of tires of the same nominal size and tread type, but with different outside diameter for articulated front-end loaders. Articulated four-wheel-drive front-end loader performance and component life can be affected by excessive differences in the tire outside circumference and/or diameter. The purpose is to provide specific guidelines for the usage of tires with different outside circumference and/or diameter on articulated front-end loaders.

2. REFERENCES

2.1 Related Publications

The following publications are provided for information purposes only and are not a required part of this SAE Technical Report.

2.1.1 SAE Publications

Available from SAE International, 400 Commonwealth Drive, Warrendale, PA 15096-0001, Tel: 877-606-7323 (inside USA and Canada) or +1 724-776-4970 (outside USA), www.sae.org.

SAE J1057 Identification Terminology of Earthmoving Machines

SAE J1116 Categories of Off-Road Self-Propelled Work Machines

SAE J1544 Revolutions Per Mile and Static Loaded Radius for Off-Road Tires

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3. DEFINITIONS

3.1 OVERALL DIAMETER (OD)

Largest dimension of the tire extremities measured at the tire centerline. This measurement should be taken in an unloaded and inflated condition.

3.2 CIRCUMFERENCE

Distance around outside of tire measured at the centerline of tread. This measurement should be taken in an unloaded and inflated condition.

4. FIELD OF APPLICATION

All four tires shall be the same nominal size. This will minimize tire dimensional differences. Tires of different construction type (e.g., radial, bias, or bias belted) may be used on different axles, but both tires on the same axle shall be of the same construction type. This document pertains to standard configured articulated loaders only. If articulated loader is equipped with no-spin differential or tire chains, consult the articulated loader manufacturer.

5. DETERMINING TIRE MATCH

- 5.1 Tire circumference/diameter on the same axle shall be within 3% of each other. Tire circumference/diameter between front axle set and rear axle set shall be within 6% of each other. See Figure 1.

Always follow vehicle manufacturer requirements if more restrictive differences are required between tire diameters or tire rolling circumferences.

5.1.1 Overall diameter variance for drive axles.

- 5.1.1.1 Exceeding these limits increases the risk of serious mechanical damage to the machine and will cause irregular and premature tire wear.

- 5.1.1.2 Caution: If both radial and bias tires are used on the same vehicle, then the rolling radius difference between the two type of tires shall also be considered.

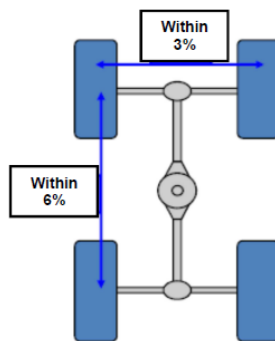


Figure 1 - Overall diameter variance for drive axles

- 5.2 Procedure for verifying dimensional correctness of four tires on an articulated loader:

- 5.2.1 Measure all four tires, inflated to their proper working pressures.

- 5.2.2 Left front and the right front shall be within 3% of each other.

- 5.2.3 Left rear and the right rear shall be within 3% of each other.

- 5.2.4 Left front and right front **average** and the left rear and right rear **average** shall be within 6% of each other.