SURFACE VEHICLE RECOMMENDED PRACTICE

J2315™ JAN2026

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Superseding J2135 JUL2021

Wheel Nut Seat Strength

RATIONALE

This document has been updated to add a reference to SAE J3204.

SAE J2315 has been reaffirmed to comply with the SAE Five-Year Review policy.

1. SCOPE

The purpose of this test is to evaluate the axial strength of the nut seat of wheels intended for use on passenger cars, light trucks, and multipurpose vehicles. In addition, a minimum contact area is recommended to ensure enough strength for the rotational force in tightening a nut against the nut seat. While this test ensures the minimum strength of the nut seat, the wheel must also have a degree of flexibility. This flexibility, as well as bolt tension, are important to maintain wheel retention.

2. REFERENCES

2.1 Applicable Documents

The following publications form a part of this specification to the extent specified herein. Unless otherwise indicated, the latest issue of SAE publications shall apply.

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 J2316 Wheel Nut Seat System Test Procedures and Performance Requirements for Passenger Cars and Light Trucks

2.2 Related Publications

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

2.2.1 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 J328 Wheels - Passenger Car and Light Truck Performance Requirements and Test Procedures

SAE J1982 Nomenclature - Wheels for Passenger Cars, Light Trucks, and Multipurpose Vehicles

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Full document details: SAE J2315-2026 Wheel Nut Seat Strength

SAE J2283 Mechanical and Material Requirements for One Piece Wheel Nuts

SAE J2530 Aftermarket Wheels - Passenger Cars and Light Truck - Performance Requirements and Test Procedures

SAE J3204 Aftermarket Composite Wheels Made of Matrix Material and Fiber Reinforcement Intended for Normal Highway Use - Test Procedures and Performance Requirements

3. TEST PROCEDURES

3.1 Wheels for Test

Use only fully processed wheels including all coatings representative of production parts intended for the vehicle.

3.2 Test Equipment

See Figure 1.

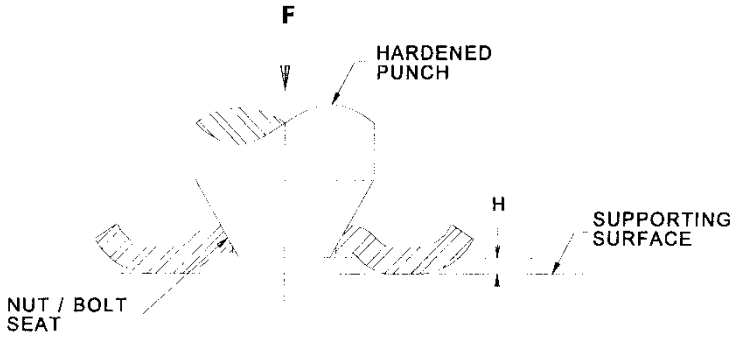

Figure 1 - Test equipment and nomenclature

The test equipment must be capable of supporting the complete wheel mounting area with a rigid flat surface. The equipment will provide a hardened (Rc 45 min) punch with a contact surface shape representative of the fastener specified for the wheel. The punch applies a measured axial force (F) (non-rotational) perpendicular to the supporting surface. Only one nut seat of a wheel is loaded at a time. In addition to the loading mechanism, devices to measure punch travel (H) are required.

3.3 Deformation Test

3.3.1 Test Method

a. Insert the test wheel in the loading device and align the punch with the nut seat.

b. Apply a load (Fo) to the nut seat and measure the nut seat height (Ho).

c. Apply a load (F) and hold for 15 seconds.

d. Reduce the load to (Fo) and measure the nut seat height (H1).

e. Repeat steps c. and d. five times and measure the nut seat height (Hn) at Fo load each time.

f. Repeat steps a. through e. on each nut seat of the wheel.

The initial force (Fo) and final force (F) for some fastener sizes are shown in Table 1. For sizes not shown or for evaluation of new finishes, materials, or systems, the fastener shall be tightened using the procedure defined in SAE J2316 and the maximum force value obtained for five sample initial tightenings to the minimum ultimate torque (refer to Table 1 of SAE J2316) should be used as F and 0.6 times F should be used for Fo. The values for the test should be for the largest fastener used with the wheel.

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