

Submitted for recognition as an American National Standard

TIRE TO BODY CLEARANCE CHECK FOR RECREATIONAL VEHICLES

Foreword—This Reaffirmed Document has been changed only to reflect the new SAE Technical Standards Board Format.

1. **Scope**—The purpose of this SAE Recommended Practice is to set guidelines for tire to wheel house and body clearances on recreational vehicles.

2. **References**

2.1 **Applicable Publications**—The following publications form a part of the specification to the extent specified herein. Unless otherwise indicated the latest revision of SAE publications shall apply.

2.1.1 SAE PUBLICATION—Available from SAE, 400 Commonwealth Drive, Warrendale, PA 15096-0001.

J683—Tire Chain Clearance

2.1.2 TIRE & RIM ASSOCIATION PUBLICATION—Available from Tire & Rim Association, 175 Montrose West Avenue, Copley, OH 44321.

Tire & Rim Association Handbook

3. **Basic Requirements**

3.1 **Front Tire to Body Clearance**

3.1.1 FRONT NON-DRIVING AXLE—A minimum all-around clearance of 13.0 mm (0.50 in) is recommended between tire and body and chassis when tire is positioned according to procedure described in 5.1.

3.1.2 FRONT DRIVING AXLE—A minimum all-around clearance of 13.0 mm (0.50 in) is recommended between tire and body and chassis when tire is positioned according to procedure described in 5.1. If it is desired to provide tire chain clearance, refer to SAE J683.

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3.2 Rear Tire to Body Clearance

- 3.2.1 REAR NON-DRIVING OR TRAILER AXLE—A minimum all-around clearance of 13.0 mm (0.50 in) is recommended between tire and body and chassis when tire is positioned according to procedure described in 5.2.
- 3.2.2 REAR DRIVING AXLE—A minimum all-around clearance of 13.0 mm (0.50 in) is recommended between tire and body and chassis when tire is positioned according to procedure described in 5.2. If it is desired to provide tire chain clearance, refer to SAE J683.

4. Method of Determining Clearances

- 4.1 **Design Layout**—Clearances may be checked by scale layout drawing using tire profile, of the size being used, developed according to Tire & Rim Association definition of maximum envelope dimensions for grown tires in service. (See current T&RA Handbook.)
- 4.2 **Vehicle Check**—Clearance may be checked by actually jouncing tire through geometry specified in Section 5 on the vehicle. It is recommended that a tire model made to Tire & Rim Association maximum envelope dimensions for grown tires in service (see current T&RA Handbook) be used for this type of check.

5. Design Check Procedure

5.1 Front Tires

- 5.1.1 INDEPENDENT FRONT SUSPENSION—Analysis of tire to body clearance to be made under the conditions in Table 1 at front wheel geometry.

TABLE 1—ANALYSIS OF TIRE TO BODY CLEARANCES

Steering Angle (Inside Wheel) ⁽¹⁾	Ride Position
Figure 1	Figure 2
0°	Full jounce to full rebound (metal to metal)
10°	Full jounce (metal to metal)
20°	1/2 Ride jounce bumper compression
Full Turn	1/3 Ride jounce bumper compression

1. Outside wheel angle established by vehicle steering geometry.

- 5.1.2 SOLID AXLE FRONT SUSPENSION—Analysis of tire to body clearances to be made under the conditions of front wheel geometry in Figure 3.

5.2 Rear Tires

- 5.2.1 INDEPENDENT REAR SUSPENSION—Analysis of tire to body clearances to be made through complete range of rear wheel travel, full rebound to full jounce (metal to metal) position.
- 5.2.2 SOLID AXLE REAR SUSPENSION
- 5.2.2.1 *Two Wheel Jounce*—Analysis of tire to body clearances to be made through complete range of rear axle travel, full rebound to full jounce (metal to metal) position. See Figure 5.
- 5.2.2.2 *One Wheel Jounce*—Analysis of tire to body clearance to be made by restraining one wheel in its design position and jouncing other wheel to full metal to metal position. See Figure 6A.

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5.2.2.3 *Alternate Proposal*—One Wheel Jounce—Analysis of tire to body clearance to be made by jouncing one wheel to metal to metal position with axle tilted at 5 degrees. See Figure 6B.

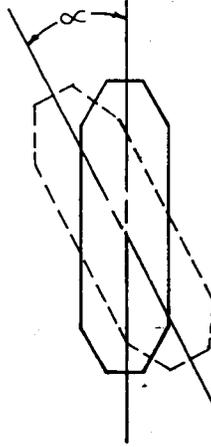


FIGURE 1—STEERING ANGLE

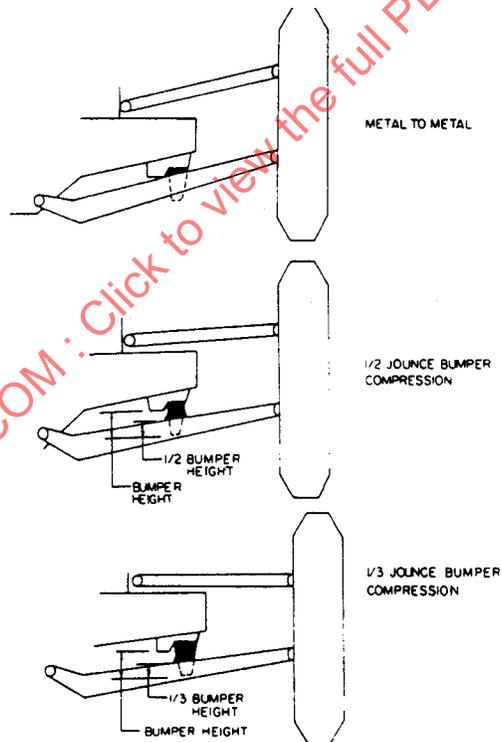


FIGURE 2—RIDE POSITION—INDEPENDENT FRONT SUSPENSION

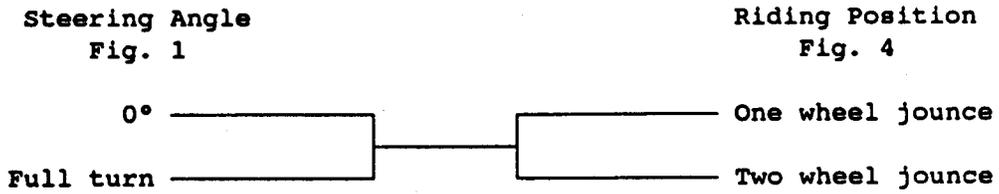


FIGURE 3—TIRE TO BODY CLEARANCE CONDITIONS FOR FRONT WHEEL GEOMETRY

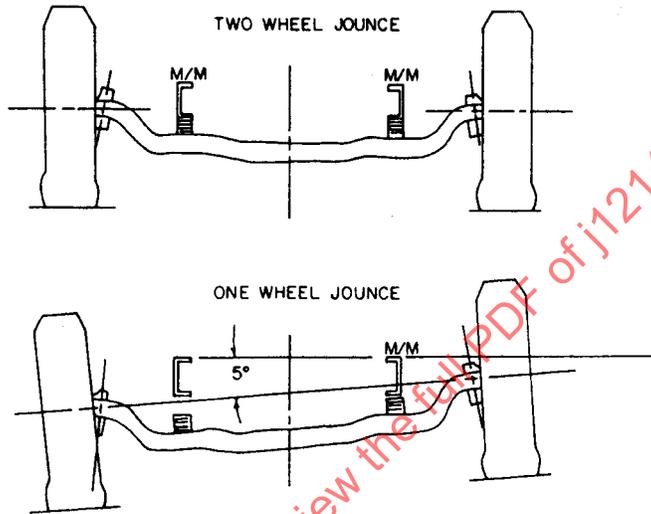


FIGURE 4—RIDE POSITION—SOLID AXLE FRONT SUSPENSION

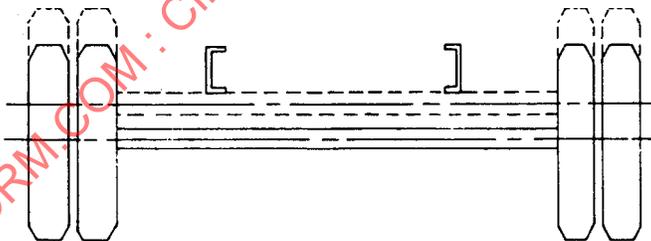


FIGURE 5—SOLID AXLE REAR SUSPENSION TRAVEL—TWO WHEEL JOUNCE

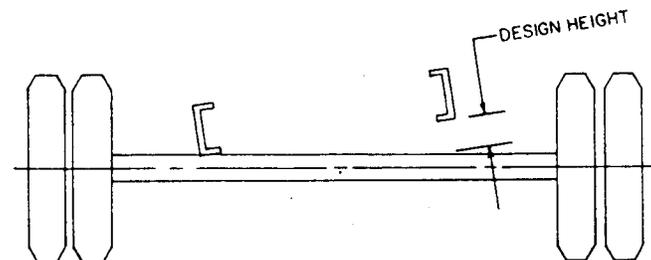


FIGURE 6A—SOLID AXLE REAR SUSPENSION TRAVEL—ONE WHEEL JOUNCE