



SURFACE VEHICLE RECOMMENDED PRACTICE

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Trailer Axle Alignment

RATIONALE

The Vehicle Characterization Committee which owned the report has become inactivated and the technical expertise for the subject report within the Truck-Bus Council is not available at this time.

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1. **Scope**—The scope of this SAE Recommended Practice, trailer axle alignment, is to identify the dimensional limits of, and a method to, establish a perpendicular relationship between the king pin centerline and the axle centerline at its midpoint. Various types of equipment are commercially available which can be used for this measurement which provides varying degrees of accuracy, but none can be endorsed by SAE.

The most fundamental methods of measurement will be described here, but other equipment is available if a greater degree of accuracy is desired.

2. **References**

- 2.1 **Related Publications**—The following publications are provided for information purposes only and are not a required part of this document. Unless otherwise stated, the latest version of SAE publications shall apply.

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

SAE J875 JUN85—Trailer Axle Alignment

- 2.1.2 TRUCK MANUFACTURER PUBLICATIONS—Available from The Maintenance Council, American Trucking Associations, 2200 Mill Road, Alexandria, VA 22314-5388.

TMC Recommended Practice RP-708; 1997 Rev.
TMC Recommended Practice RP-71-90

- 2.1.3 DANA CORPORATION PUBLICATION—Available from Dana Corporation, P.O. Box 974, 4500 Dorr Street, Toledo, OH 43615.

Spicer Trailer Products

- 2.1.4 WABASH NATIONAL PUBLICATION—Available from Wabash National, P.O. Box 6129, 1000 Sagamore Parkway, S., Lafayette, IN 47905.

Trailer Alignment Procedure

3. **Procedure**

- 3.1 Prior to any alignment efforts, the suspensions, axles, subframes, and attaching parts should be inspected for proper installation and absence of looseness or wear. If any looseness, wear, or installation abnormalities are observed, they must be corrected prior to alignment to ensure long-term satisfactory performance.
- 3.2 To ensure the best possible tire wear, it is advisable to check the toe-in of each axle. A fundamental toe-in check can be made by using the procedure outlined in the section titled Toe-In, or more accurate measurement can be obtained using available laser-measuring devices.
- 3.3 For trailers that are designed to operate with a slope and have suspensions with different design heights to accommodate that slope, the alignment procedure should be done with the trailer at the designed slope.
- 3.4 For trailers that operate with a slope, but all the suspensions have the same recommended design height; perform the alignment with the trailer level.
- 3.5 For trailers that operate level and all of the suspensions have the same recommended design height, perform the axle alignment with the trailer level.
- 3.6 For trailers with sliding subframes, the sliding subframe should be located at the rear-most location of the slide mechanism. The lock pins must be positioned to the rear of the holes in the lock rails, the same as they would be during normal vehicle operation. To assure this rearward location, it is recommended that a tensioning device be temporarily attached between the rear of the slider and the rear of the trailer. When tension is applied to the device, it will assure that the slider is in its rearward position with the lock pins properly engaged. In addition to its rearward position, the slider should be located so that the clearance between the four corners of the slider frame and the inside of the lock rails is equal. If the clearances are not equal, it may be necessary to install temporary shims to make the corner clearances equal.

4. **Toe-In**—The following procedure described is a basic method to check trailer axle toe-in.

- 4.1 Check that the wheel bearings are in working order, have the proper clearance, and are lubricated.
- 4.2 If the axle is cambered, assure that the camber marks are properly orientated, usually on the top.
- 4.3 Load the vehicle and locate it on a flat level surface.
- 4.4 Scribe a fine vertical line approximately $\frac{1}{2}$ inch long on the middle of the tread of one tire in each wheel set, on the rear side of the tire, at the same height as the centerline of the axle is above the floor. Repeat this on each axle.
- 4.5 Measure each axle for the distance (x_1) between the scribed lines on opposite sides of the vehicle on the same axle as shown in Figure 1. Record the dimensions.
- 4.6 Move the trailer forward until the scribed lines are on the rear side of the axle and at the same vertical height from the floor as they were when located at the front.
- 4.7 Measure the distance (x_2) between the same scribed lines and record the dimensions.
- 4.8 The difference between the dimensions on an individual axle must be $\frac{1}{4}$ in or less for toe-in and a maximum of $\frac{1}{16}$ in for toe-out. (Toe-in has smaller dimension at front, toe-out has larger dimension at front).