SAE International

SURFACE VEHICLE INFORMATION REPORT

SAE J701 JAN2014

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Superseding J701 AUG1984

Truck Tractor Semitrailer Interchange Coupling Dimensions

RATIONALE

Revisions are made for clarification and editorial correction to Equation 1 and Tire and Rim Association, Inc., publication reference prior to stabilizing this Information Report.

1. SCOPE

The information in this SAE Information Report is the result of studies by the Automobile Manufacturers Association, American Trucking Association, and Truck Trailer Manufacturers Association, to achieve interchangeability of equipment which will comply with the legal dimensional limitations for the majority of states and yet permit increased loading space within these dimensions. This in no way supersedes other information in the SAE Handbook on this subject.

Some cases will require more care in application allowing splash shield clearance at trailer support interference points and positioning fifth wheel to allow trailer swing clearance on an 11% grade. All dimensions are given in inches.

Table 1 and Figures 1 and 2 show basic requirements for interchangeability of truck tractor and semitrailer equipment. Figure 3 shows the interchangeability of the doubles converter dolly.

TABLE 1 - HEIGHT[1] FROM TOP FACE OF TRACTOR FIFTH WHEEL TO GROUND UNCOUPLED

Representative Tire Size	Height	Representative Tire Size	Height
7.50/20	43	11.00/20	49
8.25/20	44	11.00/22	51
9.00/20	46	11.00/24	53
10.00/20	48	12.00/20	51
10.00/22	49	12.00/24	55
10.00/24	50		

1 Height can vary by ± 1 in.
a. Trailer support height retracted, 14 in.
b. Semitrailer brake connection locations, see SAE J702.
c. Air hose length, 118 in recommended.

NOTE: Fifth wheel height = 48 (10.00 x 20 tires) standard unless otherwise specified. For tubeless and low-profile tire equivalents; see the Tire and Rim Association Standards.

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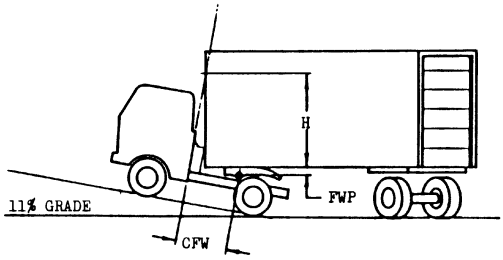
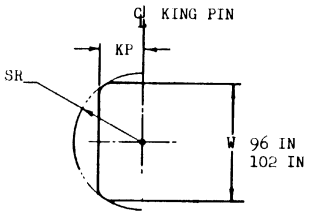
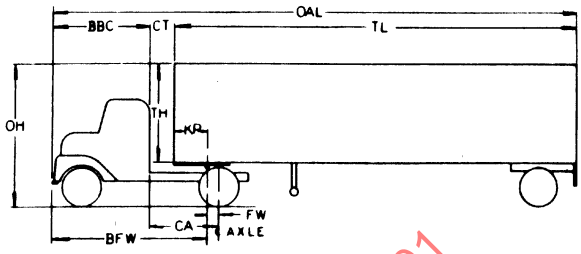
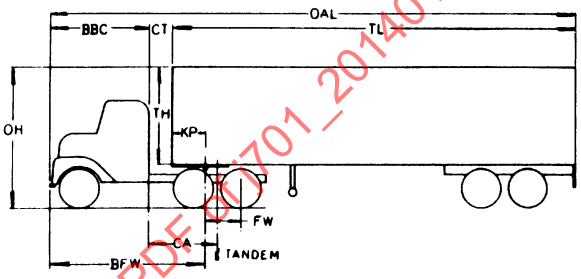




Trailer Width, in.	Corner R	SR
96	10 in.	56
102	10 in	58-1/2
96	Square	60
102	Square	62-1/2





SYMBOLS FOR TRUCK TRACTOR SEMITRAILER INTERCHANGE COUPLING DIMENSIONS

TRAILER

TL	TRAILER LENGTH
SR*	SWING RADIUS (60 IN. FOR 96 IN. WIDTH, 62½ IN. FOR 102 IN. WIDTH)
KP	FRONT OF TRAILER TO KINGPIN, 36 IN.
LWC**	KINGPIN TO TRAILER SUPPORT CLEARANCE, 90 IN. (64 IN. FOR SHORT TRAILERS INTENDED FOR USE WITH 2 AXLE TRACTORS)
TH	TRAILER HEIGHT

TRACTOR

CFW	BACK OF CAB TO 5TH WHEEL (ZERO CLEARANCE BETWEEN TRACTOR AND TRAILER CORNER ON AN 11% GRADE)
BBC	BUMPER TO BACK OF CAB
BFW	BUMPER TO 5TH WHEEL
FW	KINGPIN TO REAR AXLE
CA	CAB TO AXLE

COMBINATION

W	WIDTH
OAL	OVERALL LENGTH
OH	OVERALL HEIGHT
CT	CLEARANCE BETWEEN REAR OF CAB AND TRAILER FRONT IN STRAIGHT AHEAD POSITION

*Maximum dimensions for square front trailer.
**For determining LWC on support mounting structure of frame, top of tire is assumed to be 3 in. below trailer coupler plate.

FIGURE 1

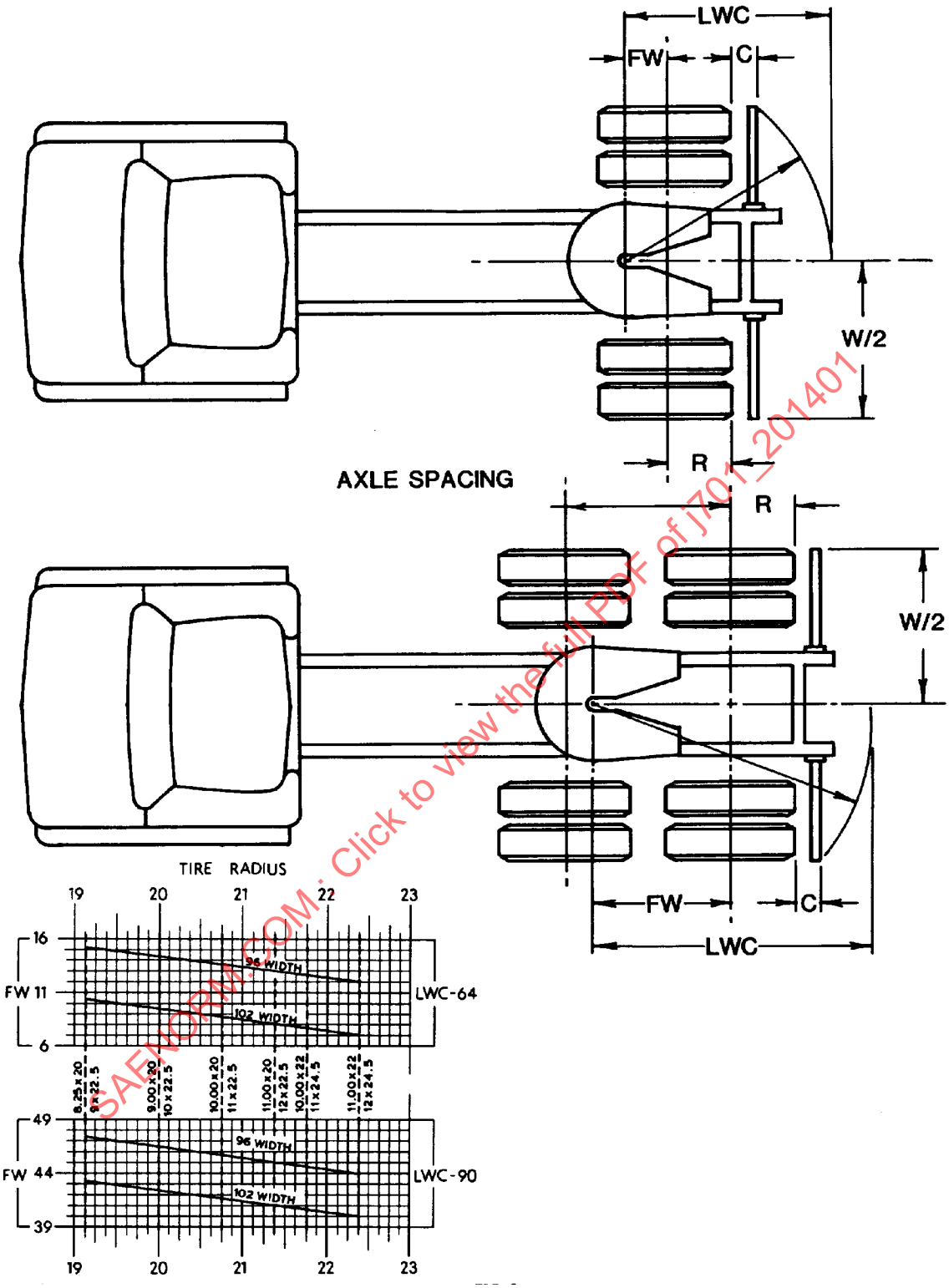


FIGURE 2

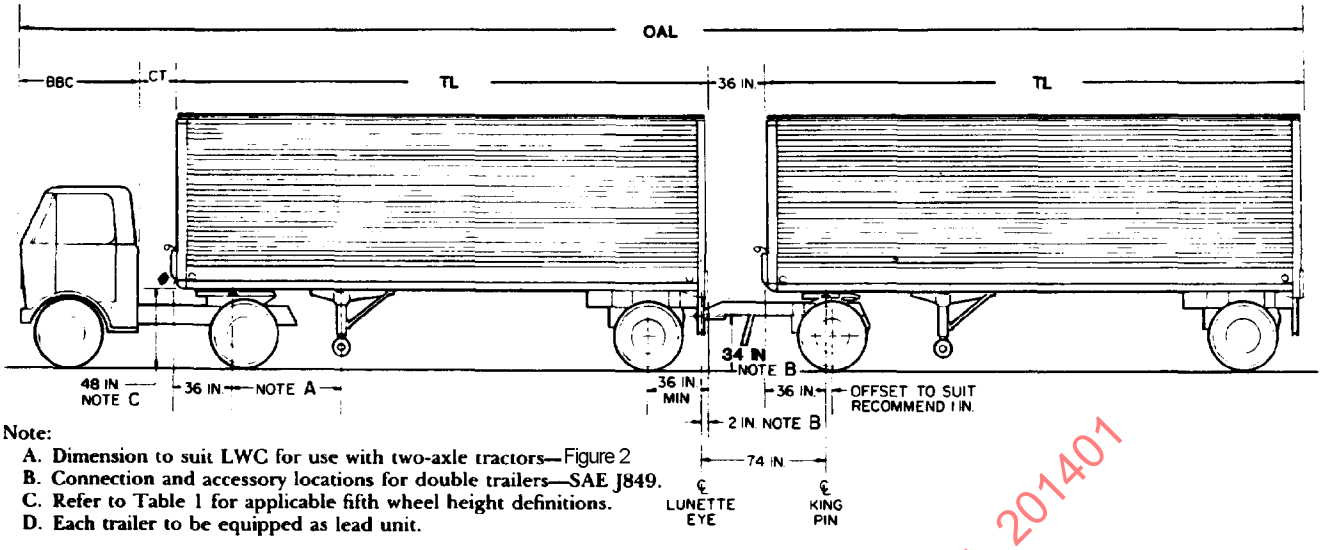
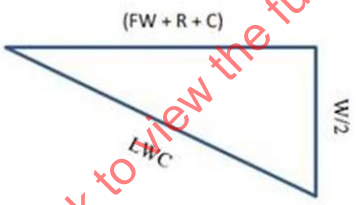


FIGURE 3

The formulas for determining LWC, OAL and CFW are:

$$LWC^2 = (W/2)^2 + (FW + R + C)^2 \quad \text{(Eq. 1)}$$



where:

FW = fifth wheel advance
R = Rear axle tire radius
LWC = 90 in
= 64 in (short trailers specifically intended for use with two axle tractors)
W = 96 in
= 102 in
C = Clearance, 4 in

OAL

$$OAL = (TL - KP) + BFW$$
$$OAL = (TL - KP) + (BBC + CFW)$$
$$OAL = TL + CT + BBC \quad \text{(Eq. 2)}$$

$$CFW = (H + FWP) \times \sin 6 \text{ deg } 17' + (SR \times \cos 6 \text{ deg } 17') \quad \text{(Eq. 3)}$$

where:

H = Distance from intersection at back of cab and trailer swing radius to top of fifth wheel with zero trailer clearance to first obstruction
FWP = Top face of fifth wheel to centerline of pivot, 3.50 in
SR = Swing radius of trailer corner