SAE International™ SURFACE VEHICLE STANDARD

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Rolling Circumference Index Groups for Radial Tractor Drive Tires

1. *Scope*—This SAE Standard is established for the following purpose:

a. Simplify the application of radial drive wheel tires to agricultural vehicles especially those with multiple drive axles having tires of different sizes.
b. Provide a pattern to combine similar sized tires into **Rolling Circumference Index** groups with uniform spacing between groups.
c. Bias drive tires are not included in this Standard.

2. *References*

2.1 Applicable Publications—The following publication forms a part of this specification to the extent specified herein.

2.1.1 TIRE AND RIM ASSOCIATION, INC.—Tire and Rim Association, 175 Montrose West Avenue, Suite 150, Copley, OH 44321.

Tire and Rim Association, Inc. Annual Year Book

3. *Definitions*

3.1 Rolling Circumference (RC)—The distance traveled by a tire in one revolution with no relative slip between the tire and ground. The measurement is made on a flat level hard surface and unless otherwise specified is done with the tire loaded to its rated capacity and inflated to its corresponding rated inflation pressure.

3.2 Rolling Circumference Index (RCI)—An integer index value assigned to each rolling circumference target dimension. The index is selected to begin at RCI = 0 for a RC of 500 mm. For an increase of 10:1 in RC, 44 steps of approximately 5.4%/step occur.

$$RC_{nom} = 500*(10**(RCI/44)) \quad \text{Round to nearest 5 mm} \qquad \text{(Eq. 1)}$$

3.3 Tolerance —Any particular tire size may be assigned to a nominal RCI number group per the following formula:

$$RCI = ROUND(44*LOG10(RC/500)) \pm 0.2 \text{ RCI max deviation} \qquad \text{(Eq. 2)}$$

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3.4 **Tire Marking—**Adding the RCI number to the tire identification (sidewall stamping) is optional but if applied should be of the form: RCI 46 with a space between the RCI and the integer number (46 in this example).

4. Technical Detail

4.1 All dimensions are expressed in **SI** units.

4.2 Rolling Circumference Index groups have been selected to accommodate existing tire sizes. As a result, vehicles designed for use with existing tires should work with tires designed to the new standard and new vehicles designed for new tire sizes should also accept many existing sizes.

4.3 The ratio of Rolling Circumference is the same between any two Rolling Circumference Index groups having the same difference in RCI group numbers. This allows convenient identification of suitable tire sets in MFWD tractors. For example, a rear tire in RCI group 46 mated with a front tire in RCI group 41 represents a 5 RCI step difference. Any other tire set with a 5 RCI step difference would mechanically fit the tractor.

4.4 Tires with industry service codes R-1 and R-1W have whole number RCI values whereas service code R-2 tires are positioned on the 0.5 increment of RCI due to the unique dimensional difference associated with R-2 tires.

4.5 Basic tire dimensions for each tire size are as defined by the Tire and Rim Association, Inc., and other tire standards publications.

4.6 Figures 1 and 2 show representative radial tires positioned in their respective locations in the RCI family groups. This list is not intended to be all-inclusive. **Contact your tire supplier for additional available radial sizes and what RCI value those tires have and where they fit in the group tables**.

RCI Rolling Circumference Index	RC (mm)	290 (11.2)	320 (12.4)	340 (13.6)	380 (14.9)	420 (16.9)	480 (18.4)	520 (20.8)	600 (23.1) 620 (24.5)	710 (28.0)	800+(30.5+)
Minimum Recommended Row Width - Inches											
	Front	20	22	24	26	30	32		40+		
	Rear		20		22	26	30	32	40+		
		Tire Section Width - mm (inches)									
48	6,165				380/90R54		480/80R50	520/85R46	620/70R46	710/70R42	800/70R38
47	5,850		320/90R54		380/90R50		18.4R46 480/80R46	20.8R42 520/85R42	620/70R42	710/70R38	900/50R42
46	5,550		320/90R50		14.9R46 380/90R46	420/80R46	18.4R42 480/80R42	20.8R38 + 520/85R38	620/70R38		
45	5,270		320/90R46				18.4R38 480/80R38	520/70R38	600/65R38		
44	5,000	290/85R46	320/90R42		380/80R42	16.9R38 420/85R38	18.4R34 480/85R34	540/75R34	620/75R30		
43	4,745	290/90R42	320/80R42	13.6R38	380/80R38	16.9R34 420/85R34	480/70R34 18.4R30	540/65R34	600/70R30		
42	4,505	290/90R38	320/85R38		14.9R34 380/85R34	16.9R30 420/90R30	480/70R30		600/65R28		
41	4,275	290/95R34	320/85R34		14.9R30 380/85R30	16.9R28 420/85R28	480/70R28				
40	4,055				14.9R28 380/85R28	420/70R28 16.9R26					
39	3,850			13.6R28							

FIGURE 1—Recommended R-1 and R-1W Tires for Tractors

RCI Rolling Circumference Index	RC (mm)	290 (11.2)	320 (12.4)	340 (13.6)	380 (14.9)	420 (16.9)	480 (18.4)	520 (20.8)	20 (23.1) (24.5)	710 (28.0)	800+ (30.5+)
Minimum Recommended Row Width - Inches: Front		20	22	24	26	30	32		40+		
Minimum Recommended Row Width - Inches: Rear			20		22	26	30	32	40+		
48.5	6,330							520/85R46			
47.5	6,005						18.4R46	20.8R42			900/65R32
46.5	5,700						18.4R42	20.8R38			
45.5	5,410		320/90R46	340/85R46			18.4R38				
44.5	5,135										
43.5	4,870										
42.5	4,625					16.9R30					
41.5	4,385					16.9R28					
40.5	4,165										
39.5	3,950										

Tire Section Width - mm (inches)

FIGURE 2—Recommended R-2 Tires for Tractors

PREPARED BY THE SAE AGRICULTURAL TRACTOR TIRE SUBCOMMITTEE OF
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