Designed by Olesen, Mortimer and Bradley
Updated by D. A. Voss Later updated by JM Juett

1 General

This wheel contour is specified for optimum track holding ability and most prototypical appearance within the Interchange limits of NMRA standards S--4.2

1.1 Introduction and Intended Use (Informative)

Wheels of this contour will perform at their best on track conforming to the limits of NMRA STANDARD S-3.2 and consistent with RP-10, RP-11 and R-12.

1.2 References

This standard should be interpreted in the context of the following NMRA Standards, Technical Notes, and Technical Information.

1.2.1 Normative

- S-4.2 Wheels Standard Scales

1.2.2 Informative

- S-3.2 Track Standard Scales
- RP-10 Trackwork General
- RP-11 Curvature and Rolling Stock
- RP-12 Turnouts General

1.3 Terminology

Term	Definition
N	Wheel Width
T	Wheel flange width (thickness).
W	Wheel tread width (N-T)
D	Wheel flange depth
P	Gauging point. is the point of tangency between R1 and R2 and the point of crossing of R2 with the inside of the wheel. It is the point where the wheel makes contact with the head of the rail.
R1	Filet radius between the wheel flange and wheel tread.
R2	Inner radius, inside radius of wheel flange.
R3	Outer radius, outside radius of wheel flange.
Ogive	A pointed, smoothly tapered curve used in architecture, ballistics, and aerospace engineering. The shape of R2 & R3 at the point of the wheel flange.

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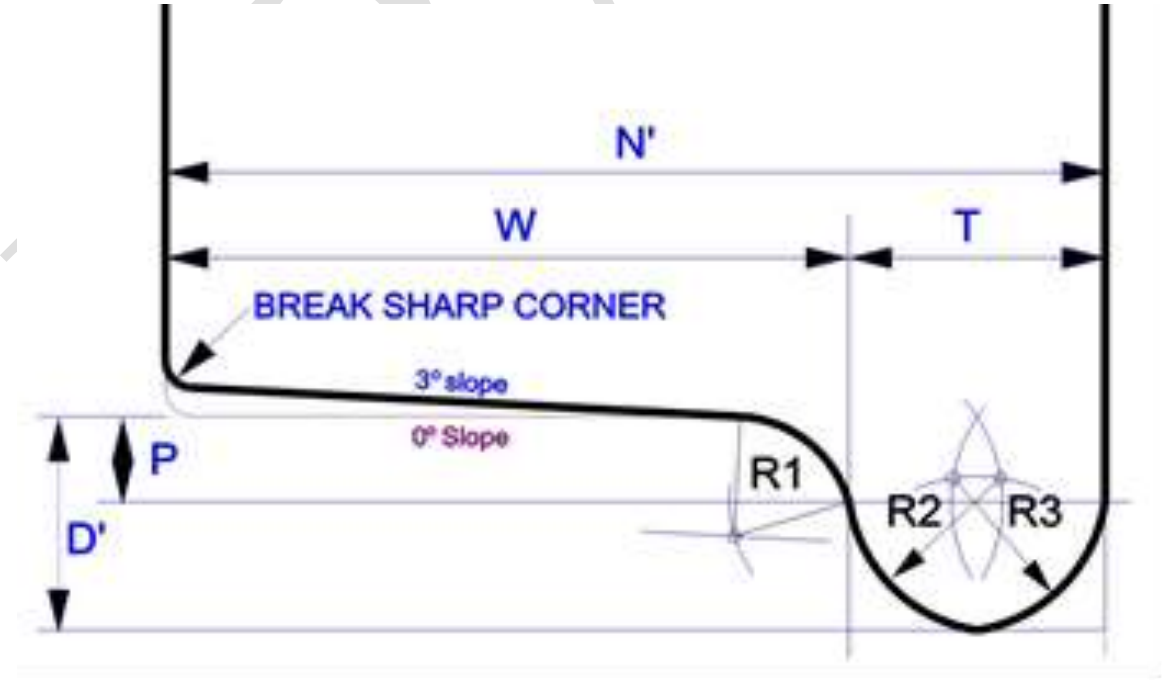
2 Content Section

The dimensions of this RP were specified to give improved performance and track holding ability, reducing derailments. The general shape defined in RP-25 mimics that of the prototype, however dimensions are proportionally much greater than the prototype. For prototype dimensions refer to S-4.1 Wheels Fine Scale & Proto.

2.1 Cross Section of Wheel



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~~2.3~~2.2 Wheel Dimensions

Imperial inch (metric mm)

WHEEL CODE	TIRE WIDTH N′ nominal	FLANGE WIDTH T maximum	TREAD WIDTH W nominal	FLANGE DEPTH D′ nominal	GAGING POINT P	FILLET RADIUS R1	INNER RADIUS R2	OUTER RADIUS R3
175	.175(4.45)	.048(1.22)	.127(3.23)	.045(1.14)	.015(.38)	.025(.64)	.028(.71)	.028(.71)
145	.145(3.68)	.039(.99)	.106(2.69)	.036(.91)	.013(.33)	.021(.53)	.023(.58)	.023(.58)
126	.126(3.20)	.036(.91)	.090(2.29)	.028(.71)	.012(.30)	.018(.46)	.021(.53)	.021(.53)
116	.116(2.59)	.031(.79)	.085(2.16)	.026(.66)	.011(.28)	.014(.36)	.018(.46)	.018(.46)
110	.110(2.79)	.030(.76)	.080(2.03)	.025(.64)	.010(.25)	.014(.36)	.018(.46)	.018(.46)
93	.093(2.36)	.026(.66)	.067(1.70	.020(.51)	.009(.23)	.~~009~~012(.30)	.017(.43)	.017(.43)
88	.088(2.24)	.025(.64)	.063(1.60)	.~~023~~021(.51)	.009(.23)	.012(.30)	.015(.38)	.015(.38)
79	.079(2.01)	.~~023~~020(.51)	.056(1.42)	.020(.51)	.008(.20)	.011(.28)	.014(.36)	.014(.36)
72	.072(1.83)	.020(.51)	.052(1.32)	.020(.51)	.008(.20)	.010(.25)	.012(.30)	.012≥30)
54	.054(1.37)	.014(.36)	.040(1.02)	.016(.41)	.007(.18)	.008(.20)	.009(.23)	.009(.23)

NOTES:

1. Wheels listed above provide a selection meeting the interchange requirements of Standard S-4.2 Wheels Standard Scales.
2. N′ and D′ are Nominal design dimensions providing reasonable tolerance within the limits specified by N and D of standards S-4.2 Wheels Standard Scales.
3. T and W are measured at the Gaging Point P which is the point of tangency between R1 and R2 and the point of crossing of R2 with the inside of the wheel.
4. Radii at the edge of the flange should be as large as possible within prescribed limits to reduce side friction against the railhead to protect Frog Points by decreasing effective Wheel Check Gage and to guide the flange through Flangeways and past other obstructions. This geometric shape is an ogive, giving the best probability for the flange to pass without bumping the frog, wing or guard rail.
5. Tread Taper is not required, but 1 degree and 3 degree mold release draft is allowed. Note that new prototype wheels include a taper in anticipation of wear. Worn wheels show a reverse taper. A taper will also help center the wheels on the track. A wheel taper acts as a differential when negotiating curves. A draft is preferred over a flat tread.
6. Accurate measurements of P, R1, R2 & R3 require expensive equipment such as an optical comparator. The NMRA developed an RP-25 Gauge that gives a close approximation for all dimensions on code 145, 110, 88 and 72 wheels.
7. LS (Large Scale) wheels (code 256) follow G1MRA profile and are not presently covered under RP-25.

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3 Document History

Date	Description
Mar 1997	First Release Olesen, Mortimer and Bradley
July 2009	Redrew diagram and updated format of document. Revised by DA Voss
Sep 9 2026	Migrated to new template, additional information added, clarified dimensions to agree with S-4.2 Wheels Standard Scales. Added metric dimensions. JM Juett

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