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Replacing TB/T 449-2003

Wheel profile for locomotive and car

机车车辆车轮轮缘踏面外形

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Wheel profile for locomotive and car

1 Scope

This standard specifies the type and profile of wheel rim tread profiles for railway rolling stock.

This standard applies to machined rolling stock wheels.

2 Types and contours

2.1 There are 8 types of rolling stock wheel rim tread shape prototypes, the models of which are: LM, LM_A, LM_B, LM_C, LM_D, JM, JM_2, JM_3. The contours are as shown in Figures 1 ~ 8, respectively.

2.2 There are 25 types of thin rim tread shapes for rolling stock maintenance, including 9 types of LM thin rim treads and 16 types of JM thin rim treads, see Table 1.

2.3 See Appendix A for the point coordinates of the tread contours of LM_B type and LM_C type.

2.4 See Appendix B for the drawing method of rim tread contour.

2.5 See Appendix C for the comparison table between the old and new names of CN type, XP55 type, LMD type rim treads.

Appendix B

(Informative)

Drawing method of rim tread contour

B.1 General

The drawing method of rim tread contour is divided into the tread contour drawing method and the rim contour drawing method.

See Figure B.1, for the schematic outline of the LM_A type rim tread.

See Figure B.2, for a schematic outline of the LM_B type rim tread.

See Figure B.3, for a schematic outline of the LM_C type rim tread.

See Figure B.4, for a schematic outline of the LM_D type rim tread.

See Figure B.5, for a schematic outline of the rim tread of LM-28 type, LM-27.5 type, LM-27 type, LM-26 type.

See Figure B.6, for a schematic outline of LM-31.5 type, LM-31 type, LM-30 type, LM-29.5 type, LM-29 type, LM type, JM type, JM_2 type, JM_2 thin rim, JM_3 type, JM_3 thin rim tread.

B.2 Drawing benchmark

Take OX, OY as the coordinate axis, axis X as the tread baseline. The symbol markings are as shown in Figure B.1 ~ Figure B.6, respectively, according to different rim tread models.

B.3 Method for drawing tread contour curve

B.3.1 The specific drawing method of LM_A type tread curve is as follows:

a) Taking point O as the center and R_7 as the radius, draw an arc aa', which intersects the straight line $x = L_3$ on the right side of the Y axis, at point O_7;

b) Taking point O_7 as the center and R_7 - R_6 as the radius, draw an arc bb', which intersects the straight line $x = L_2$ on the left side of the Y axis, at point O_6;

c) Taking point O_6 as the center and R_6 - R_5 as the radius, draw an arc cc';

d) Taking point F ($-70 + B_1$, H_1) as the center of the circle and R_5 as the radius, draw arc dd'. dd' and cc' intersect at point O_5;

e) Taking point O_5 as the center and R_5 as the radius, draw a straight line gg', that forms an angle of -70° with the X-axis and is tangent to the circle;

f) Taking point O_6 as the center and R_6 as the radius, draw a circle;

g) Taking point O_7 as the center and R_7 as the radius, draw a straight line segment I'I, which has a slope of -1:40 and is tangent to the circle. The tangent point is I'; the abscissa of point I is $x = L_4$;

h) Draw a straight line segment IM, which has a slope of -1:15 through point I (the length of IM is determined by the rim width);

i) Make MN straight segment, where MN is a 5×5 chamfer.

B.3.2 The specific drawing method of LM_B type tread curve is as follows:

a) Make a curve segment G-H-I, from the point coordinates of the tread contour;

b) Using point F ($-70 + B_1$, H_1) as the center and R_5 as the radius, draw arc dd'. Using point G as the center and R_5 as radius, draw arc ee'. dd' and ee' intersect at point O_5;

c) Taking point O_5 as the center and R_5 as the radius, draw a circle. Draw a straight line gg', that forms an angle of -70° with the X-axis and is tangent to the circle;

d) Draw a straight line segment IM, which has a slope of -1:15, through point I (the length of IM is determined by the rim width);

e) Make MN straight segment, where MN is a 5×5 chamfer.

B.3.3 The specific drawing method of LM_C type tread curve is as follows:

a) Create a curve segment G-O, from the point coordinates of the tread contour;

b) Taking point F ($-70 + B_1$, H_1) as the center and R_5 as the radius, draw arc dd'. Using point G as the center and R_5 as radius, draw arc ee'. dd' and ee' intersect at point O_5;

c) Taking point O_5 as the center and R_5 as the radius, draw a circle. Meanwhile, make a straight line gg', that forms an angle of -68°40' with the X-axis and is tangent to the circle;

d) Draw a straight line segment OI, which has a slope of -5.5:100 through point O; the abscissa of point I is $x = L_4$;

e) Draw a straight line segment IM, which has a slope of -15:100 through point I (the length of IM is determined by the rim width);

g) Taking point O_7 as the center and $R_7 + R_8$ as the radius, draw an arc ff', that intersects the straight line $x = L_4$ on the right side of the Y-axis, at point O_8;

h) Taking point O_8 as the center and R_8 as the radius, draw a circle. Make a straight line segment IM, which has a slope of -1:P (the length of IM is determined by the rim width), and is tangent to the circle;

i) Make MN straight segment, where MN is a 5×5 chamfer.

B.4 Drawing method of rim profile curve

B.4.1 For the LM_A type, LM_B type, LM_C type, LM_D type, LM type, LM-31.5 type, LM-31 type, LM-30 type, LM-29.5 type, LM-29 type, JM type, JM_2 type, JM_2 thin rim, JM_3 type, JM3 thin rim, the specific drawing method of rim contour is as follows:

a) Taking point O_2 ($-70 + L_1$, $H - R_2$) as the center and R_2 as the radius, draw a circle;

b) Draw a straight line at $x = -70$. Taking R_1 as the radius, draw a circle, which is tangent to the straight line at $x = -70$ and circle O_2;

c) Taking R_4 as the radius, draw a circle, which is tangent to the circle O_2 and the straight line gg'.

B.4.2 The specific drawing methods of rim shapes of LM-28 type, LM-27.5 type, LM-27 type, LM-26 type are as follows:

a) Taking point O_2 ($-70 + L_1$, $H - R_2$) as the center and R_2 as the radius, draw a circle;

b) Draw a straight line of $x = -70$. Taking R_1 as the radius, draw a circle, which is tangent to the straight line of $x = -70$ and the circle O_2;

c) Taking point O_3 ($-70 + L_1$, $H - R_3$) as the center and R_3 as the radius, draw a circle;

d) Taking point R_4 as the radius, draw a circle, which is tangent to the circle O_3 and the straight line gg'.

B.5 Trimming of rim tread curve

Cut each circle and straight line, to obtain the contour of the corresponding rim tread shape. The tangent (intersection) points are A, B, C, (C'), D, E, G, (H), O, (I'), I, M, N, (P).

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