ASME B29.15M-1997
(Revision of ASME B29.15M-1995)

STEEL ROLLER TYPE CONVEYOR CHAINS, ATTACHMENTS, AND SPROCKET TEETH

AN AMERICAN NATIONAL STANDARD

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Date of Issuance: October 31, 1997

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The American Society of Mechanical Engineers
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FOREWORD

(This Foreword is not part of ASME B29.15M-1997.)

Chains of the type covered by this Standard were introduced late in the nineteenth century. These chains met with considerable success on material conveyors and elevators. Manufacturers developed and marketed many sizes and types in the following years.

In the 1920s, a working group from the producers of these chains was formed to standardize them. In 1972, a subcommittee of American National Standards Committee B29 was appointed with American Chain Association members from the engineering steel chain industry to expand and update the existing standards.

The 1997 revision of this Standard incorporates the new definition of Minimum Ultimate Tensile Strength (M.U.T.S.), as well as updated sprocket symbols.

This revision was approved by the American National Standards Institute on April 17, 1997.

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ASME STANDARDS COMMITTEE B29
Chains, Attachments, and Sprockets for Power Transmission and Conveying

(The following is the roster of the Committee at the time of approval of this Standard.)

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STEEL ROLLER TYPE CONVEYOR CHAINS, ATTACHMENTS, AND SPROCKET TEETH

1 DEFINITIONS

M.U.T.S.: Minimum Ultimate Tensile Strength, the minimum force at which an unused, undamaged chain could fail when subjected to a single tensile loading test.

steel roller type conveyor chains: a series of roller links having steel bushings with rollers to contact the sprocket teeth, alternating with links comprised of sidebars and pins, which articulate in the steel bushings of the roller link (see Fig. 1).

2 GENERAL CHAIN PROPORTIONS AND DESIGNATIONS

2.1 M.U.T.S.

(a) M.U.T.S. is not a working load. The M.U.T.S. greatly exceeds the maximum force that may be applied to the chain.

(b) Test Procedure: A tensile force is slowly applied, in a uniaxial direction, to the ends of the chain sample.

(c) The tensile test is a destructive test. Even though the chain may not visibly fail when subjected to the Minimum Ultimate Tensile Force, it will have been damaged and will be unfit for service.

Pins and bushings are fixed in the sidebar pitch holes by either press fits and/or mechanical locks, such as flats, to prevent rotation of the pins and bushings in the sidebar pitch holes.

2.2 Measuring Load

The measuring load in pounds or newtons, listed in Table 1, is the load under which a dry or lightly lubricated chain should be measured for length.

2.3 Strand Length Tolerance

New chains under measuring load may be over the theoretical length up to 0.38 in. in 120 in. (9.7 mm in 3048 mm), but must not be under the theoretical length. Maximum and minimum strand lengths for each chain are listed in Table 1.

3 DIMENSIONS OF CHAIN LINKS

To assure interchangeability of links as produced by the different makers of chain, standard maximum and minimum dimensions are listed in Tables 2 and 3. They are not actual dimensions used in manufacturing, but limiting dimensions, maximum or minimum, required to assure the desired interchangeability. (The metric equivalent dimensions are for reference only.) Dimensions are shown in Fig. 2, where

B = inside diameter of bushing
D = pin diameter
F = overall chain height
H = roller diameter
J = pin head to centerline
K = pin end to centerline
P = assembled chain pitch (this is a theoretical reference dimension used for basic calculations)
T = sidebar thickness
U = sidebar height
V = sidebar end clearance radius
W = inside width of roller link
X = outside width of roller link
Z = width between outer sidebars

4 ATTACHMENT DIMENSIONS

See Tables 4, 5, 6, 7, and 8 for various attachment type dimensions.

5 SPROCKET TOOTH FORM

5.1 Nomenclature

Figure 3 and other parts of this Standard utilize the following nomenclature (see also Tables 9 and 10):

C_b = undersize compensation (typically 0.06 in., 1.5 mm)
C_c = chain clearance circle
C_{cf} = chain clearance circle factor (see Table 10)
C_p = pitch line clearance
D_b = bottom diameter

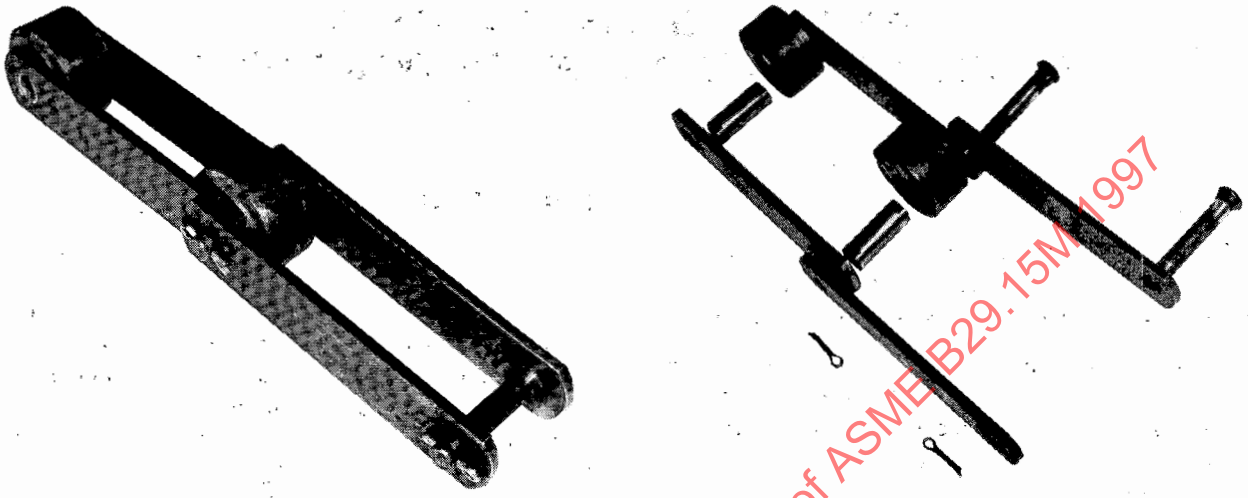

FIG. 1 STEEL ROLLER TYPE CONVEYOR CHAINS

D_o = outside diameter
D_p = pitch diameter
D_{pf} = pitch diameter factor
D_r = root diameter
H = roller outside diameter, max. (see Table 2)
N_t = number of teeth
P = chain pitch
R_p = pocket radius
R_t = topping radius
S_s = side slope
U = sidebar height, max. (see Table 3)
W_f = working face
W_t = tooth width, max.
θ = pressure angle

5.2 Sprocket Tooth Form Data

The elements of a chain sprocket and the tooth form may be determined by the following:

Pitch diameter:	$D_p = P \times D_{pf}$
Root diameter max.:	$D_r = (P \times D_{pf}) - H$ max.[1]
Chain clearance circle:	$C_c = P(C_{cf} - 0.05) - U$ max.[2]
Outside diameter:	$D_o = (P \times C_{cf}) + U$ max.[3]
Pitch line clearance:	$C_p = P \times 0.10$ to $P \times 0.15$
Pitch diameter factor:	$D_{pf} = csc(180/N_t)$
Clearance circle/outside diameter factor:	$C_{cf} = cot(180/N_t)$
Pressure angle:	θ
Working face:	$W_f = 0.01 \times P \times N_t$[4]
Pocket radius max.:	$R_p = H/2$[1]
Topping radius:	$R_t = 0.5 \times P$
Tooth width:	$W_t = 0.95\ W$ min. of chain
Side slope:	S_s = approx. $0.12 \times W_t$ (not to exceed 0.38 in., 9.6 mm)
Bottom diameter:	$D_b = D_r - C_b$

[1] The bottom diameter should be smaller than the root diameter and the pocket radius should be smaller than $H/2$. Oversize dimensions cause improper chain and sprocket action and excessive chain loads.

[2] No portion of hub, beads, lugs, or fillets shall extend beyond this circle in the sidebar zone.

[3] Outside diameter may be increased to give a full height tooth when the top of the chain is clear of flights, pans, buckets, etc. Tooth working face length provides for approximately 5% chain pitch elongation.

[4] Limitation on length of working face: the working face shall not extend beyond the line through the adjacent pitch point, which is perpendicular to the working face.

TABLE 1
GENERAL CHAIN DIMENSIONS, M.U.T.S., STRAND LENGTH, AND MEASURING LOAD

Chain No.	Chain Pitch, *P*	Pin Diameter, *D*	Roller Outside Diameter, *H*	Sidebar Height, *U*	Sidebar Thickness, *T*	Inside Width, *W*	Min. Ultimate Tensile Strength, lb	Max. Measuring Length of Nominal 120 in. Strand	Min. Measuring Length of Nominal 120 in. Strand	Measuring Load, lb
					Dimensions, in.					
2915-10	3.000	0.438	1.50	1.13	0.19	1.00	11,000	120.38	120.00	200
2915-20	4.000	0.438	1.50	1.13	0.19	1.00	11,000	120.38	120.00	200
2915-30	4.000	0.438	2.00	1.25	0.19	1.13	14,000	120.38	120.00	200
2915-40	4.000	0.500	1.50	1.25	0.25	0.88	16,000	120.38	120.00	200
2915-50	4.000	0.625	2.25	1.50	0.38	1.31	24,000	120.38	120.00	500
2915-60	6.000	0.438	2.00	1.25	0.25	1.13	15,000	120.38	120.00	200
2915-70	6.000	0.563	2.50	1.50	0.25	1.25	20,000	120.38	120.00	400
2915-80	6.000	0.625	2.00	1.50	0.31	1.31	23,000	120.38	120.00	300
2915-90	6.000	0.750	3.00	2.00	0.38	1.38	33,000	120.38	120.00	500
					Dimensions, mm					
2915-10	76.20	11.13	38.1	28.7	4.8	25.4	48.95	3057.7	3048.0	0.9
2915-20	101.60	11.13	38.1	28.7	4.8	25.4	48.95	3057.7	3048.0	0.9
2915-30	101.60	11.13	50.8	31.8	4.8	28.7	62.30	3057.7	3048.0	0.9
2915-40	101.60	12.70	38.1	31.8	6.4	22.4	71.20	3057.7	3048.0	0.9
2915-50	101.60	15.88	57.2	38.1	9.7	33.3	106.80	3057.7	3048.0	2.2
2915-60	152.40	11.13	50.8	31.8	6.4	28.7	66.75	3057.7	3048.0	0.9
2915-70	152.40	14.30	63.5	38.1	6.4	31.8	89.00	3057.7	3048.0	1.8
2915-80	152.40	15.88	50.8	38.1	7.9	33.3	102.35	3057.7	3048.0	1.3
2915-90	152.40	19.05	76.2	50.8	9.7	35.1	146.85	3057.7	3048.0	2.7

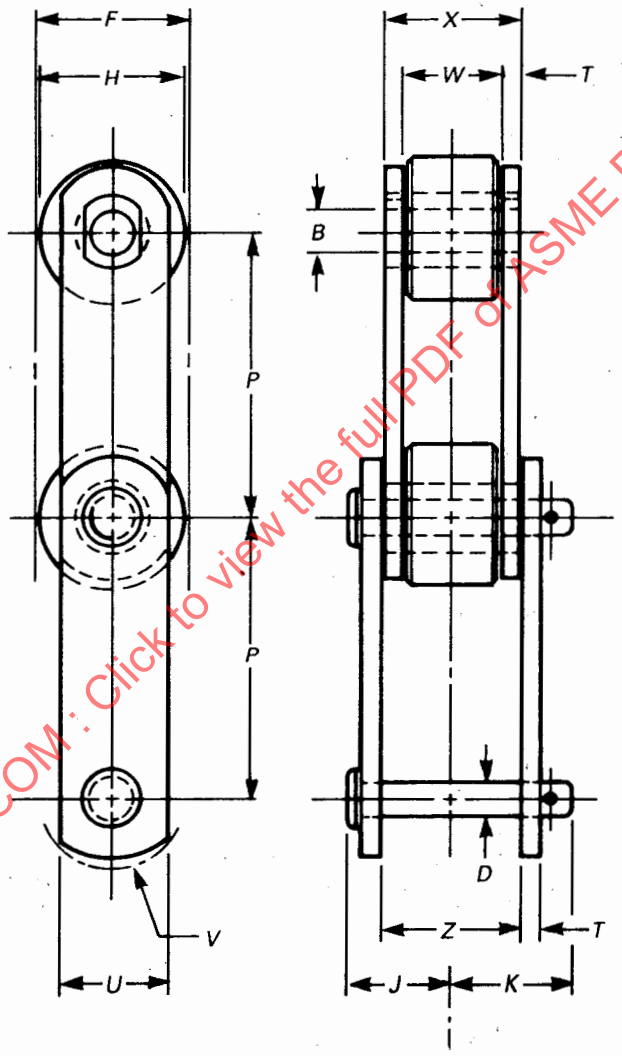

FIG. 2 DIMENSIONS OF CHAIN LINKS

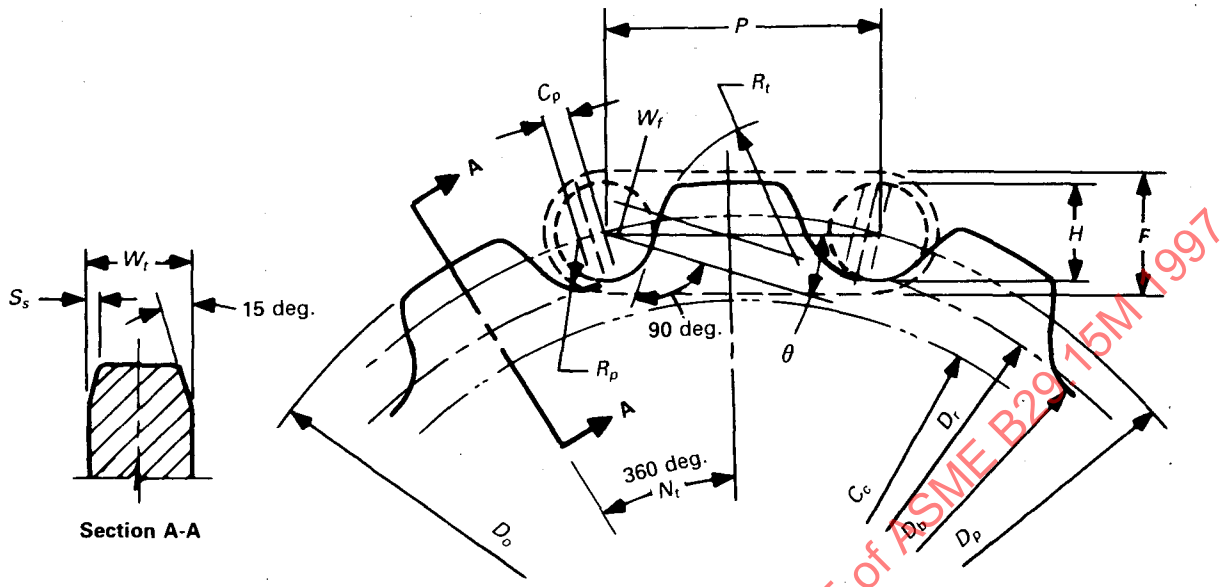

FIG. 3 SPROCKET TOOTH FORM

TABLE 2
MAXIMUM AND MINIMUM CONTROLLING DIMENSIONS FOR INTERCHANGEABLE CHAIN LINKS

Chain No.	Chain Pitch, *P*	Pin Diameter, *D*, Max.	Bushing Inside Diameter, *B*, Min.	Roller Outside Diameter, *H*, Max.	Width Between OSSB, *Z*, Min.	Width of Roller Link, *X*, Max.	Width Between ISSB, *W*, Min.
			Dimensions, in.				
2915-10	3.000	0.441	0.446	1.51	1.40	1.39	0.96
2915-20	4.000	0.441	0.446	1.51	1.40	1.39	0.96
2915-30	4.000	0.441	0.446	2.01	1.52	1.51	1.09
2915-40	4.000	0.503	0.508	1.51	1.40	1.39	0.83
2915-50	4.000	0.628	0.633	2.26	2.09	2.08	1.26
2915-60	6.000	0.441	0.446	2.01	1.65	1.64	1.08
2915-70	6.000	0.566	0.571	2.51	1.77	1.76	1.20
2915-80	6.000	0.628	0.633	2.01	1.97	1.96	1.26
2915-90	6.000	0.753	0.758	3.01	2.15	2.14	1.33
			Dimensions, mm				
2915-10	76.20	11.20	11.33	38.4	35.6	35.3	24.4
2915-20	101.60	11.20	11.33	38.4	35.6	35.3	24.4
2915-30	101.60	11.20	11.33	51.1	38.6	38.4	27.7
2915-40	101.60	12.78	12.90	38.4	35.6	35.3	21.1
2915-50	101.60	15.95	16.08	57.4	53.1	52.8	32.0
2915-60	152.40	11.20	11.33	51.1	41.9	41.7	27.4
2915-70	152.40	14.38	14.50	63.8	45.0	44.7	30.5
2915-80	152.40	15.95	16.08	51.1	50.0	49.8	32.0
2915-90	152.40	19.13	19.25	76.5	54.6	54.4	33.83

TABLE 3 CHAIN CLEARANCE DIMENSIONS

Chain No.	Chain Height, *F*, Max.	Sidebar Height, *U*, Max.	Sidebar End Clearance Radius, *V*, Min.	Attachment Clearance Radius, *R*, Min.	Pin Head to Centerline, *J*, Max.	Pin End to Centerline, *K*, Max.
			Dimensions, in.			
2915-10	1.52	1.18	0.69	0.71	1.06	1.26
2915-20	1.52	1.18	0.69	0.71	1.06	1.26
2915-30	2.02	1.31	0.78	0.80	1.16	1.35
2915-40	1.52	1.31	0.78	0.80	1.18	1.35
2915-50	2.27	1.56	0.90	0.92	1.67	1.91
2915-60	2.02	1.56	0.90	0.92	1.28	1.44
2915-70	2.52	1.56	0.90	0.92	1.36	1.66
2915-80	2.02	1.56	0.90	0.92	1.67	1.78
2915-90	3.02	2.06	1.20	1.22	1.79	2.06
			Dimensions, mm			
2915-10	38.6	30.0	17.5	18.0	26.9	32.0
2915-20	38.6	30.0	17.5	18.0	26.9	32.0
2915-30	51.3	33.3	19.8	20.3	29.5	34.3
2915-40	38.6	33.3	19.8	20.3	30.0	34.3
2915-50	51.7	39.6	22.9	23.4	42.4	48.5
2915-60	51.3	39.6	22.9	23.4	32.5	36.6
2915-70	64.0	39.6	22.9	23.4	34.5	42.2
2915-80	51.3	39.6	22.9	23.4	42.4	45.2
2915-90	76.7	52.3	30.5	31.0	45.5	52.3

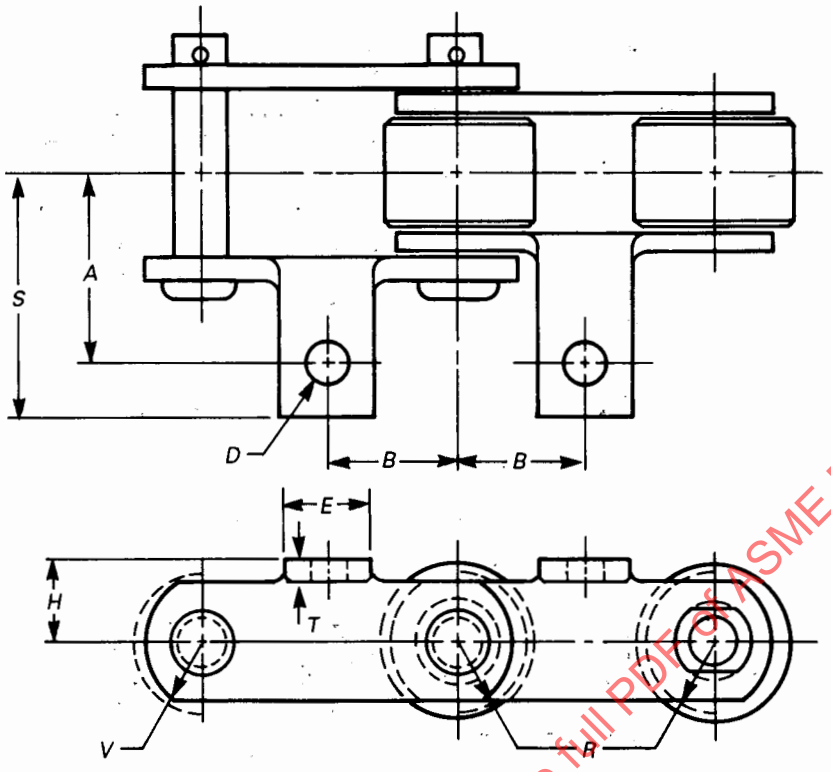

TABLE 4 A-1 ATTACHMENTS

Chain No.	A	B	E, Max.	H	S, Max.	T, Max.	R, Min.	D, Nominal Bolt	D, Min. Hole
				Dimensions, in. [Note (1)]					
2915-10	1.47	1.50	2.03	0.81	2.25	0.22	0.71	0.312	0.33
2915-20	1.38	2.00	2.53	0.81	2.25	0.22	0.71	0.375	0.40
2915-30	2.00	2.00	3.41	1.12	2.72	0.22	0.80	0.375	0.40
2915-40	1.38	2.00	2.75	0.88	2.00	0.28	0.80	0.375	0.40
2915-50	2.00	2.00	2.78	1.25	3.00	0.41	0.92	0.500	0.53
2915-60	2.00	3.00	3.50	1.25	2.81	0.28	0.92	0.375	0.40
2915-70	2.00	3.00	3.03	1.12	3.03	0.28	0.92	0.500	0.53
2915-80	2.00	3.00	3.03	1.12	2.66	0.34	0.92	0.500	0.53
2915-90	2.12	3.00	2.53	1.62	3.53	0.41	1.22	0.500	0.53
				Dimensions, mm [Note (1)]					
2915-10	37.3	38.1	51.6	20.6	57.2	5.6	18.0	7.93	8.4
2915-20	35.1	50.8	64.3	20.6	57.2	5.6	18.0	9.53	10.2
2915-30	50.8	50.8	86.6	28.5	69.1	5.6	20.3	9.53	10.2
2915-40	35.1	50.8	69.9	22.4	50.8	7.1	20.3	9.53	10.2
2915-50	50.8	50.8	70.6	31.8	76.2	10.4	23.7	12.70	13.5
2915-60	50.8	76.2	88.9	31.8	71.4	7.1	23.7	9.53	10.2
2915-70	50.8	76.2	77.0	28.5	77.0	7.1	23.7	12.70	13.5
2915-80	50.8	76.2	77.0	28.5	67.6	8.6	23.7	12.70	13.5
2915-90	53.9	76.2	64.3	41.2	89.7	10.4	31.0	12.70	13.5

NOTE:
(1) For *V* dimension, see Table 3.

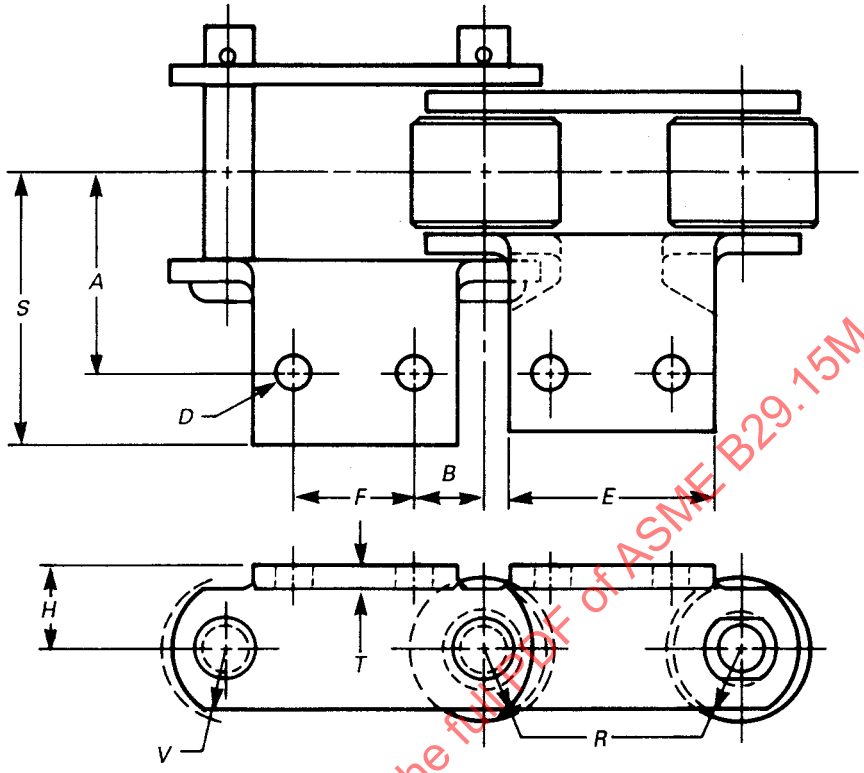

TABLE 5 A-2 ATTACHMENTS

Chain No.	*A*	*B*	*E*, Max.	*F*	*H*	*S*, Max.	*T*, Max.	*R*, Min.	*D*, Nominal Bolt	*D*, Min. Hole
Dimensions, in. [Note (1)]										
2915-10	1.47	0.97	2.03	1.06	0.81	2.25	0.22	0.71	0.250	0.27
2915-20	1.38	1.41	2.53	1.19	0.81	2.25	0.22	0.71	0.312	0.33
2915-30	2.00	1.00	3.41	2.00	1.12	2.72	0.22	0.80	0.375	0.40
2915-40	1.38	1.25	2.53	1.50	0.88	2.09	0.28	0.80	0.375	0.40
2915-50	2.00	1.25	2.88	1.50	1.25	2.89	0.41	0.92	0.375	0.40
2915-60	2.00	2.00	3.50	2.00	1.25	2.81	0.28	0.92	0.375	0.40
2915-70	2.00	2.00	3.50	2.00	1.12	3.03	0.28	0.92	0.375	0.40
2915-80	2.00	2.00	3.53	2.00	1.12	2.88	0.34	0.92	0.375	0.40
2915-90	2.12	1.69	5.53	2.62	1.62	2.9	0.41	1.22	0.500	0.53
Dimensions, mm [Note (1)]										
2915-10	37.3	24.6	51.6	26.9	20.6	57.2	5.6	18.0	6.35	6.9
2915-20	35.1	35.8	64.3	30.2	20.6	57.2	5.6	18.0	7.93	8.4
2915-30	50.8	25.4	86.6	50.8	28.5	69.1	5.6	20.3	9.53	10.2
2915-40	35.1	31.8	64.3	38.1	22.4	53.1	7.1	20.3	9.53	10.2
2915-50	50.8	31.8	73.2	38.1	31.8	73.4	10.4	23.7	9.53	10.2
2915-60	50.8	50.8	88.9	50.8	31.8	71.4	7.1	23.7	9.53	10.2
2915-70	50.8	50.8	88.9	50.8	28.5	77.0	7.1	23.7	9.53	10.2
2915-80	50.8	50.8	89.7	50.8	28.5	73.2	8.6	23.7	9.53	10.2
2915-90	53.9	42.9	140.5	66.6	41.2	73.7	10.4	31.0	12.70	13.5

NOTE:
(1) For *V* dimension, see Table 3.

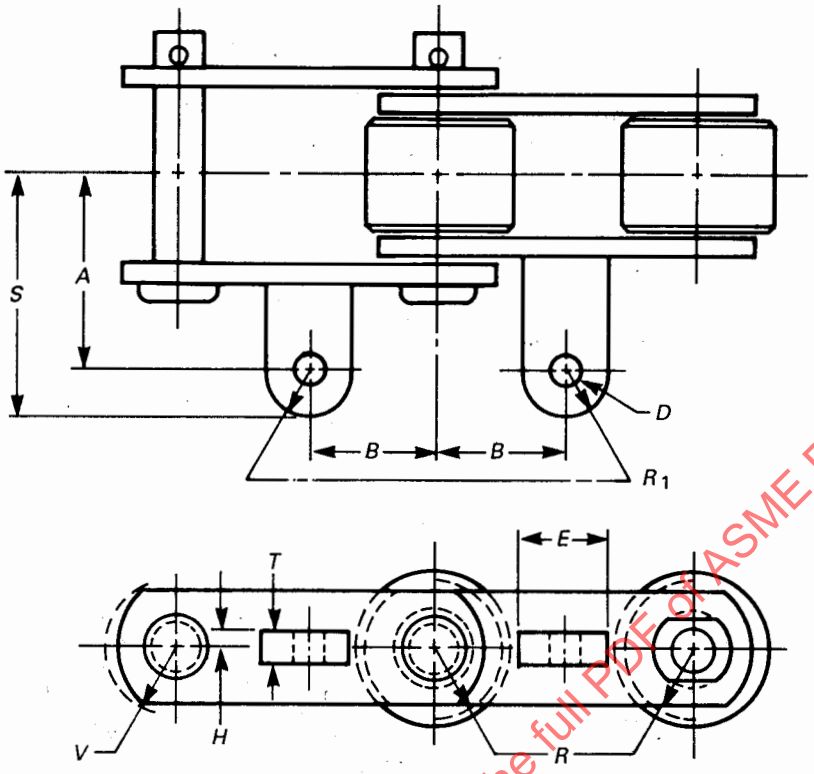

TABLE 6 A-42 ATTACHMENTS

Chain No.	A	B	E, Max.	H	S, Max.	T, Max.	R, Min.	R_1, Min.	D, Nominal Bolt	D, Min. Hole
Dimensions, in. [Note (1)]										
2915-10	1.56	1.50	1.28	0.12	2.25	0.28	0.71	0.69	0.375	0.40
2915-20	1.62	2.00	1.28	0.19	2.28	0.41	0.71	0.67	0.375	0.40
Dimensions, mm [Note (1)]										
2915-10	39.6	38.1	32.5	3.1	57.2	7.1	18.0	17.5	9.53	10.2
2915-20	41.2	50.8	32.5	4.8	57.9	10.4	18.0	17.0	9.53	10.2

NOTE:
(1) For *V* dimension, see Table 3.

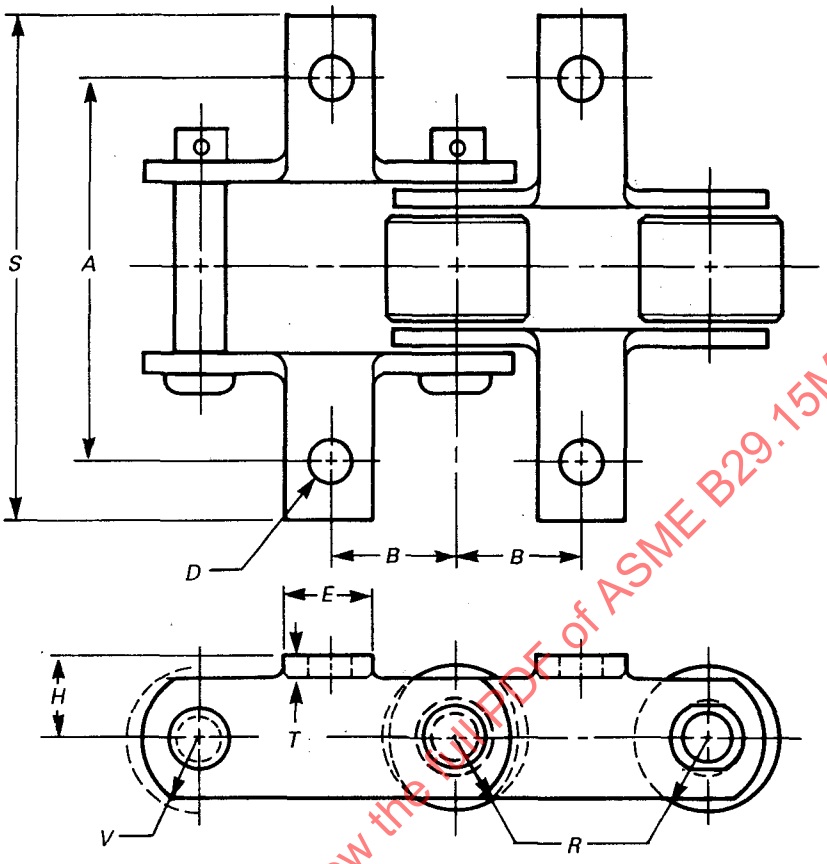

TABLE 7 K-1 ATTACHMENTS

Chain No.	A	B	E, Max.	H	S, Max.	T, Max.	R, Min.	D, Nominal Bolt	D, Min. Hole
Dimensions, in. [Note (1)]									
2915-10	2.94	1.50	2.03	0.81	3.90	0.22	0.71	0.312	0.33
2915-20	2.76	2.00	2.53	0.81	4.50	0.22	0.71	0.375	0.40
2915-30	4.00	2.00	3.41	1.12	5.44	0.22	0.80	0.375	0.40
2915-40	2.76	2.00	2.75	0.88	4.00	0.28	0.80	0.375	0.40
2915-50	4.00	2.00	2.78	1.25	6.00	0.41	0.92	0.500	0.53
2915-60	4.00	3.00	3.50	1.25	5.62	0.28	0.92	0.375	0.40
2915-70	4.00	3.00	3.03	1.12	5.38	0.28	0.92	0.500	0.53
2915-80	4.00	3.00	3.50	1.12	5.32	0.34	0.92	0.500	0.53
2915-90	4.25	3.00	2.53	1.62	7.06	0.41	1.22	0.500	0.53
Dimensions, mm [Note (1)]									
2915-10	74.7	38.1	51.6	20.6	99.1	5.6	18.0	7.93	8.4
2915-20	70.1	50.8	64.3	20.6	114.3	5.6	18.0	9.53	10.2
2915-30	101.6	50.8	86.6	28.4	138.2	5.6	20.3	9.53	10.2
2915-40	70.1	50.8	69.9	22.4	101.6	7.1	20.3	9.53	10.2
2915-50	101.6	50.8	70.6	31.8	152.4	10.4	23.4	12.70	13.5
2915-60	101.6	76.2	88.9	31.8	142.8	7.1	23.4	9.53	10.2
2915-70	101.6	76.2	77.0	28.5	136.7	7.1	23.4	12.70	13.5
2915-80	101.6	76.2	88.9	28.5	135.1	8.6	23.4	12.70	13.5
2915-90	108.0	76.2	64.3	41.2	179.3	10.4	31.0	12.70	13.5

NOTE:
(1) For *V* dimension, see Table 3.