

ASME B29.3M-1994

(REVISION OF ANSI/ASME B29.3M-1985)

Double-Pitch Power Transmission Roller Chains and Sprockets

AN AMERICAN NATIONAL STANDARD



The American Society of
Mechanical Engineers

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The American Society of
Mechanical Engineers

345 East 47th Street, New York, N.Y. 10017

Date of Issuance: June 15, 1994

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FOREWORD

(This Foreword is not part of ASME B29.3M-1994.)

For many years, roller chain manufacturers furnished for specific installations an economical power transmission chain differing only in pitch from the standardized series of transmission roller chains which conformed to American Standard ASA B29.1.

Such practice became so common and the chains of such universal use that in 1948 the Roller Chain Technical Committee of the Association of Roller Chain Manufacturers, now known as the American Chain Association, developed these standards which were submitted for adoption as an American Standard.

This Standard describes a limited series of double-pitch power transmission roller chains which supplements the base chain series conforming to the standard B29.1. These chains differ from the base chains only in pitch, which is double that of the corresponding base chain.

Supplementary information in Appendix A on speed and power transmission ratings indicates their special usefulness for drives operating at slow to moderate speeds, with moderate loads and long center distances.

In tabulating dimensional information in this Standard, customary inch-pound units have been used. Additionally, companion tabulations have been included in order to provide translations of these values into metric (SI) units in accordance with ASME Guide SI-1, ASME Orientation and Guide for Use of SI (Metric) Units. For this reason, certain formulas and relationships have been intentionally presented only in customary units so as to preclude any ambiguity between them and the tabulated values.

This revision of ASME B29.3M-1994 incorporates a restatement of the definition of Minimum Ultimate Tensile Strength and minor changes in the values for maximum pin diameter and minimum bushing inner diameter. The dimensional changes are to allow a direct error-free conversion from customary inch units to metric (SI) units. Similar changes are being made in the International Standard ISO 1275.

ASME B29.3M-1994 was approved by the American National Standards Institute on March 15, 1994.

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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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DOUBLE-PITCH POWER TRANSMISSION ROLLER CHAINS AND SPROCKETS

1 DOUBLE-PITCH POWER TRANSMISSION ROLLER CHAINS

1.1 Nomenclature

The following definitions are illustrated in Fig. 1.

connecting link (cotter pin type illustrated in Fig. 1) — an outside link consisting of a pin link plate *E*, two assembled pins *G-G*, a detachable pin link plate *D*, and two cotters *H-H*

double-pitch power transmission roller chain — a series of alternately assembled roller links and pin links in which the pins articulate inside the bushings, and the rollers are free to turn on the bushings. Pins and bushings are press-fitted in their respective link plates.

offset link (cotter pin type illustrated in Fig. 1) — a link consisting of two offset link plates *I-I*, a bushing *B*, a roller *C*, a removable pin *J*, and cotter *H*

pin link — an outside link consisting of two pin link plates *E-E* assembled with two pins *F-F*

roller link — an inside link consisting of two roller link plates *A-A*, two bushings *B-B*, and two rollers *C-C*

1.2 General Proportions

- (a) The roller diameter is approximately $\frac{5}{16} \times \text{pitch}$.
- (b) The *chain width* is defined as the distance between roller link plates and equals approximately $\frac{5}{16} \times \text{pitch}$.
- (c) The pin diameter is approximately $\frac{5}{32} \times \text{pitch}$ or one-half of the roller diameter.
- (d) The thickness of link plates is approximately $\frac{1}{16} \times \text{pitch}$.
- (e) The maximum height of link plates is $0.475 \times \text{pitch}$.

1.3 Numbering System

The numerical identification and chain numbers will be obtained by numerically adding 2000 to the standard base series chain number.

EXAMPLE: Chain No. 2040 (1 in. pitch) has double the pitch of Chain No. 40 ($\frac{1}{2}$ in. pitch) but uses the same pins, bushings, and rollers.

1.4 Minimum Ultimate Tensile Strength

(a) Single strand chains meeting the requirements of this Standard will have a minimum ultimate tensile or breaking strength equal to or greater than the listing in Table 1A.

(b) *Minimum Ultimate Tensile Strength (M.U.T.S)* for chain covered by this Standard is the minimum force at which an unused, undamaged chain could fail when subjected to a single tensile loading test.

(1) *WARNING: The Minimum Ultimate Tensile Strength is NOT a "working load."* The M.U.T.S. greatly exceeds the maximum force that may be safely applied to the chain.

(2) *Test Procedure.* A tensile force is slowly applied at a rate not to exceed 2.0 in. per min., in a uniaxial direction, to the ends of the chain sample.

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

1.5 Tolerance for Chain Length

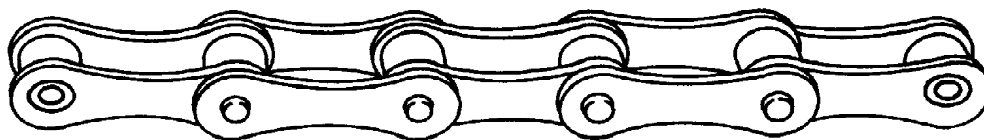
New chains, under standard measuring load, must not be underlength. Overlength tolerance is 0.016 in./ft (1.33 mm/m).

1.6 Measuring Load

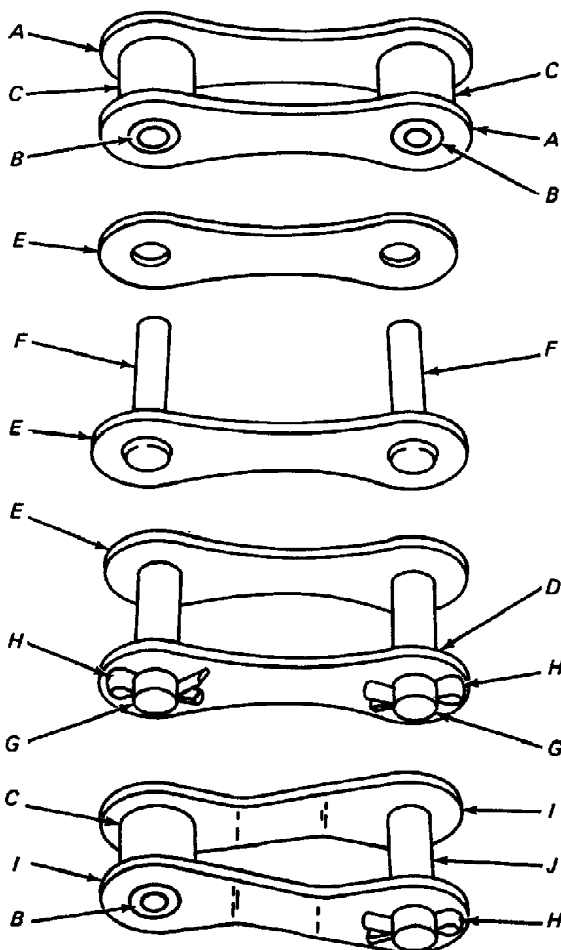
Measuring load is the load under which the chain is to be measured for length. It is equal to 1% of the minimum ultimate tensile strength, with a minimum of 31 lb (138 N). Length measurements are to be taken over a length of at least 12 in. (300 mm).

1.7 General Chain Dimensions

See Table 1A for general chain dimensions in inch units and Table 1B for millimeter units.



double-pitch power transmission roller chain — a series of alternately assembled roller links and pin links in which the pins articulate inside the bushings, and the rollers are free to turn on the bushings. Pins and bushings are press-fitted in their respective link plates.



roller link — an inside link consisting of two roller link plates A-A, two bushings B-B, and two rollers C-C

pin link — an outside link consisting of two pin link plates E-E assembled with two pins F-F

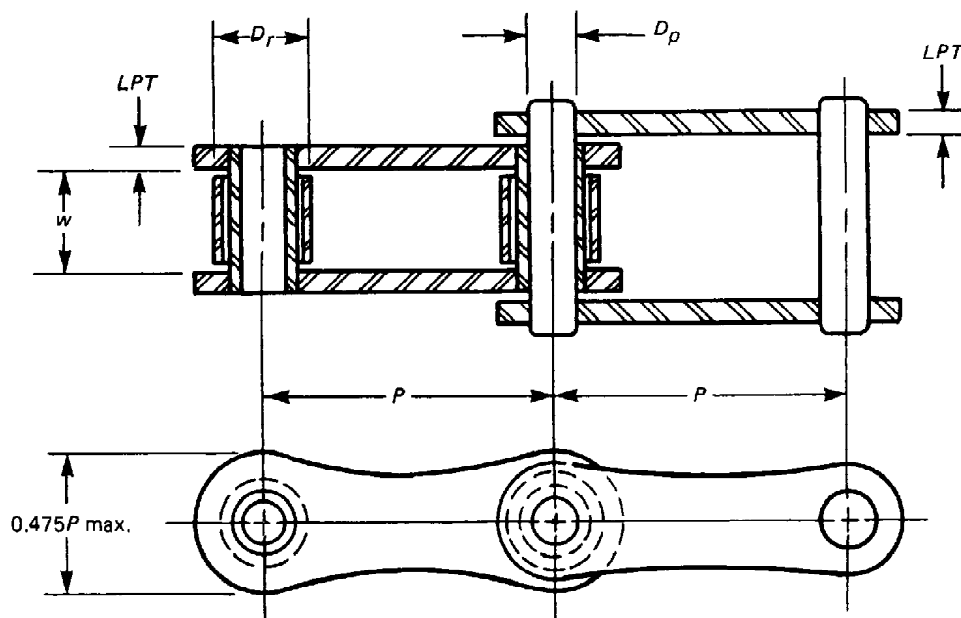
connecting link (cotter pin type illustrated) — an outside link consisting of a pin link plate E, two assembled pins G-G, a detachable pin link plate D, and two cotters H-H

offset link (cotter pin type illustrated) — a link consisting of two offset link plates I-I, a bushing B, a roller C, a removable pin J, and cotter H

FIG. 1 DOUBLE-PITCH POWER TRANSMISSION ROLLER CHAIN AND COMPONENTS

DOUBLE-PITCH POWER TRANSMISSION
ROLLER CHAINS AND SPROCKETS

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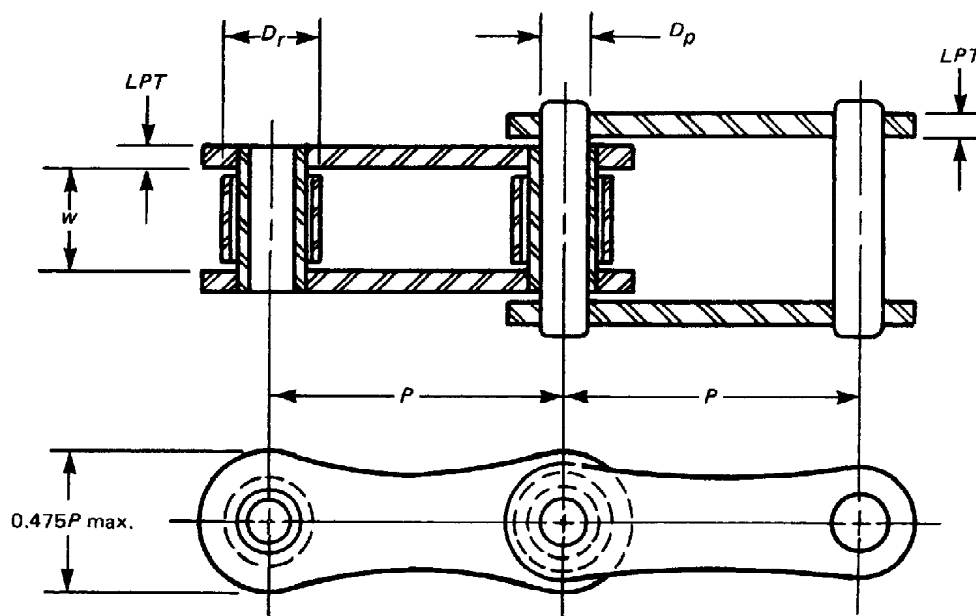
P = chain pitch
 D_r = roller diameter
 LPT = link plate thickness
 W = chain width between roller link plates, nominal [Note (1)]
 D_p = pin diameter

TABLE 1A
GENERAL CHAIN DIMENSIONS, in.

Standard Chain No.	2040	2050	2060	2080	2100	2120
P	1.000	1.250	1.500	2.000	2.500	3.000
D_r	0.312	0.400	0.469	0.625	0.750	0.875
w	0.312	0.375	0.500	0.625	0.750	1.000
D_p	0.156	0.200	0.234	0.312	0.375	0.437
LPT	0.060	0.080	0.094	0.125	0.156	0.187
Measuring load, lb	31	49	70	125	195	281
Ultimate tensile strength, min., lb	3125	4880	7030	12,500	19,530	28,125

NOTE:

(1) See Table 2A for decimal minimum dimensions.



P = chain pitch
 D_r = roller diameter
 LPT = link plate thickness
 W = chain width between roller link plates, nominal [Note (1)]
 D_p = pin diameter

TABLE 1B
GENERAL CHAIN DIMENSIONS, mm

Standard Chain No.	2040	2050	2060	2080	2100	2120
P	25.40	31.75	38.10	50.80	63.50	76.20
D_r	7.92	10.16	11.91	15.88	19.05	22.22
w	7.92	9.52	12.70	15.88	19.05	25.40
D_p	3.96	5.08	5.94	7.92	9.52	11.10
LPT	1.52	2.03	2.39	3.18	3.96	4.75
Measuring load, N	137.9	218.0	311.4	556.0	867.4	1250.0
Ultimate tensile strength, min., N	13 900	21 710	31 270	55 600	86 870	125 100

NOTE:

(1) See Table 2B for decimal minimum dimensions.

1.8 Dimensional Limits for Interchangeability

To assure interchangeability of links as produced by different makers of chain, the following standard maximum and minimum dimensions are adopted. They are not the actual dimensions to be used in manufacturing but rather the limiting dimensions, maximum and minimum, within which it is necessary to keep to assure the desired interchangeability.

(a) The minimum distance between roller link plates is the nominal width of the chain minus the quantity $(0.002 + 0.003 \times \text{pitch}/2)$.

(b) Maximum pin diameter. See Tables 2A and 2B.

(c) Minimum hole in bushing. See Tables 2A and 2B.

(d) Maximum overall width of roller link = nominal width of chain + $(2.12 \times \text{nominal link plate thickness})$

(e) Minimum distance between pin link plates = maximum overall width of roller link + 0.002

(f) Standard offset links are made to accommodate chains having link plates with a maximum height equal to $0.475 \times \text{pitch}$. Therefore, the minimum value of x (Fig. 2) is:

$$x (\text{min.}) = 0.24P + 0.030$$

where P = chain pitch

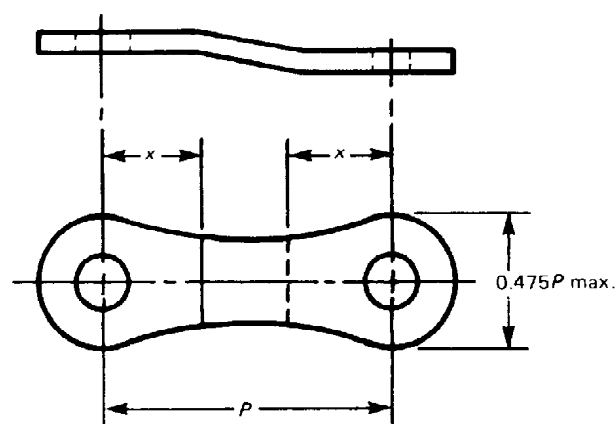


FIG. 2 OFFSET LINK PLATE

TABLE 2A
ULTIMATE DIMENSIONAL LIMITS FOR INTERCHANGEABILITY, in.

Standard Chain No.	2040	2050	2060	2080	2100	2120
P = chain pitch	1.000	1.250	1.500	2.000	2.500	3.000
D_r = max. roller diam.	0.312	0.400	0.469	0.625	0.750	0.875
m = min. distance between roller link plates	0.309	0.370	0.495	0.620	0.744	0.993
Max. width of roller link	0.440	0.545	0.699	0.890	1.081	1.396
Min. distance between pin link plates	0.442	0.547	0.701	0.892	1.083	1.398
Max. pin diam. (1)	0.1567	0.2004	0.2346	0.3126	0.3756	0.4374
Min. bushing inner diam. (1)	0.1575	0.2016	0.2354	0.3134	0.3764	0.4386
Min. value of x for offset link plates (see para. 1.8 and Fig. 2)	0.270	0.330	0.390	0.510	0.630	0.750

NOTE:

(1) In recognition of the fact that these dimensions vary from previous issues of this Standard, it will not be necessary to be in full compliance until five years from the effective date of this Standard.

TABLE 2B
ULTIMATE DIMENSIONAL LIMITS FOR INTERCHANGEABILITY, mm

Standard Chain No.	2040	2050	2060	2080	2100	2120
P = chain pitch	25.40	31.75	38.10	50.80	63.50	76.20
D_r = max. roller diam.	7.92	10.16	11.91	15.87	19.05	22.23
m = min. distance between roller link plates	7.85	9.40	12.53	15.75	18.90	25.22
Max. width of roller link	11.17	13.84	17.75	22.60	27.45	35.46
Min. distance between pin link plates	11.23	13.89	17.81	22.66	27.51	35.51
Max. pin diam. (1)	3.98	5.09	5.95	7.94	9.54	11.11
Min. bushing inner diam. (1)	4.00	5.12	5.98	7.96	9.58	11.14
Min. value of x for offset link plates (see para. 1.8 and Fig. 2)	6.86	5.38	9.91	12.95	16.00	19.05

NOTE:

(1) In recognition of the fact that these dimensions vary from previous issues of this Standard, it will not be necessary to be in full compliance until five years from the effective date of this Standard.

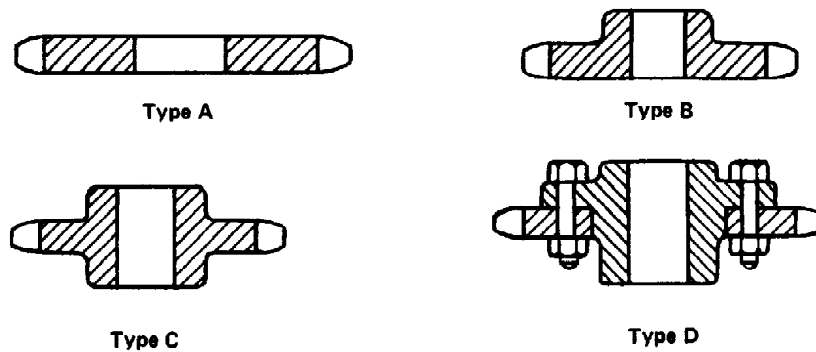


FIG. 3 TYPES OF SPROCKETS

2 SPROCKETS

2.1 Types of Sprockets

The designations for the four principal types of sprockets pictured in Fig. 3 are as follows:

- Type A — plain plate
- Type B — hub on one side only
- Type C — hub on both sides
- Type D — hub detachable

Sprocket dimensional design for these double-pitch chains is the same as for their respective base chain series except for necessary changes in diametral dimensions.

2.2 Tooth Section Profile

The section profile of Table 3A, Sections A and B, shows the recommended chamfering of sprockets for roller chains. All sprocket flanges are to be chamfered to provide guidance of the chain onto the sprocket in case of misalignment due to sprocket misalignment or permissible flange weave. Flange chamfer may be either as in Section A or B or anything in between. The sprocket chamfer dimensions R_c (g and h) are noncritical and are given only as a guide for general design proportions.

2.3 Diameters and Measuring Dimensions (See Fig. 4 and Tables 4A and 4B)

(a) Sprockets for double-pitch power transmission chains may have one or two sets of effective teeth: one set comprising those teeth that contact the chain rollers in one revolution of the chain sprocket.

(b) A sprocket is single-cut if it has only one set of effective teeth. A double-cut sprocket has two sets of effective teeth. Tooth spaces of the second set are located midway between those of the first.

(c) Double-cut sprockets with an odd number of actual teeth, such as 21, for instance, have half as many effective teeth, $10\frac{1}{2}$, for example.

(d) Double-cut sprockets with an odd number of actual teeth, such as 21, and therefore with half as many effective teeth, $10\frac{1}{2}$, provide automatic hunting, each actual tooth engaging a chain roller once during two revolutions of such a sprocket.

(e) Double-cut sprockets with an even number of actual teeth have an integral number of effective teeth and cannot provide automatic "hunting," because only one set of effective teeth can engage chain rollers, regardless of how many revolutions the sprocket may have made. Manual shifting of the chain by one-half effective tooth is necessary to provide distribution of wear to the previously inactive set of teeth.

(f) The nomenclature used in Fig. 4 is as follows:

P = chain pitch

PD = pitch diameter

BD = bottom diameter

CD = caliper diameter

D_r = roller diameter

N = number of effective teeth

$PD = [P/\sin(180 \text{ deg.}/N)] BD$

$= PD - D_r$

CD , single-cut, if N is an odd number

$= PD \cos(90 \text{ deg.}/N) - D_r$ (see footnote 1)

CD , single-cut, if N is an even number

$= PD - D_r = BD$ (see footnote 2)

CD , double-cut, if N is a fractional number

$= PD \cos(45 \text{ deg.}/N) - D_r$ (see footnote 1)

CD , double-cut whether N is an odd or even whole number

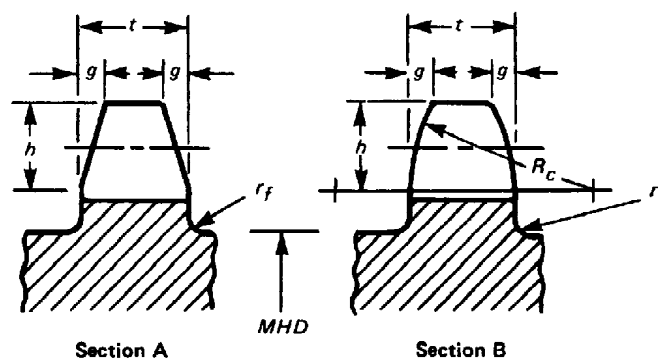
$= PD - D_r = BD$ (see footnote 2)

¹These caliper diameters are measured across any two tooth spaces that are *most nearly* diametrically opposite to each other.

²These caliper diameters are measured across any two tooth spaces that are *exactly* diametrically opposite to each other.

DOUBLE-PITCH POWER TRANSMISSION
ROLLER CHAINS AND SPROCKETS

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- MHD = maximum hub and groove diameter
 $t_{max.}$ = $0.93w - 0.006$ = maximum flange thickness
 h = approximately $0.25P$ = depth of chamfer
 g = approximately $1/16P$ but not to exceed $w/3$ = width of chamfer
 $R_{c \text{ min.}}$ = $0.532P$ (approximately tangent to side) = chamfer radius
 $r_{f \text{ max.}}$ = $0.02P$ for maximum hub diameter = fillet radius

TABLE 3A
SPROCKET TOOTH SECTION PROFILE DIMENSIONS, in.

Chain No.	Chain Pitch, P	Chain Width, w	Max. Sprocket Thickness, t	Minus Tolerance on t	Depth of Chamfer, h	Width of Chamfer, g	Min. Radius, R_c
2040	1.000	0.312	0.284	0.035	0.250	0.062	0.531
2050	1.250	0.375	0.343	0.036	0.312	0.078	0.664
2060	1.500	0.500	0.459	0.036	0.375	0.094	0.796
2080	2.000	0.625	0.575	0.040	0.500	0.125	1.062
2100	2.500	0.750	0.692	0.046	0.625	0.156	1.327
2120	3.000	1.000	0.924	0.057	0.750	0.188	1.593

TABLE 3B
SPROCKET TOOTH SECTION PROFILE DIMENSIONS, mm

Chain No.	Chain Pitch, P	Chain Width, w	Max. Sprocket Thickness, t	Minus Tolerance on t	Depth of Chamfer, h	Width of Chamfer, g	Min. Radius, R_c
2040	25.40	7.92	7.21	0.89	6.35	1.57	13.49
2050	31.75	9.52	8.71	0.91	7.92	1.98	16.87
2060	38.10	12.70	11.66	0.91	9.52	2.39	20.22
2080	50.80	15.88	14.60	1.02	12.70	3.18	26.97
2100	63.50	19.05	17.58	1.17	15.88	3.96	33.71
2120	76.20	25.40	23.47	1.45	19.05	4.78	40.46

Tolerances on the bottom or caliper diameter of sprockets:

Plus tolerance = 0.000

Minus tolerance = $0.002 \times \text{pitch} \times \sqrt{N} + 0.006$ in.
with a minimum tolerance of
0.012 in. and a maximum tolerance of 0.048 in.

Maximum hub diameter (*MHD*) of sprockets

= $P \cot [(180 \text{ deg.}/N) - 0.5] - 0.030$ in.

Approximate outside diameter of sprocket

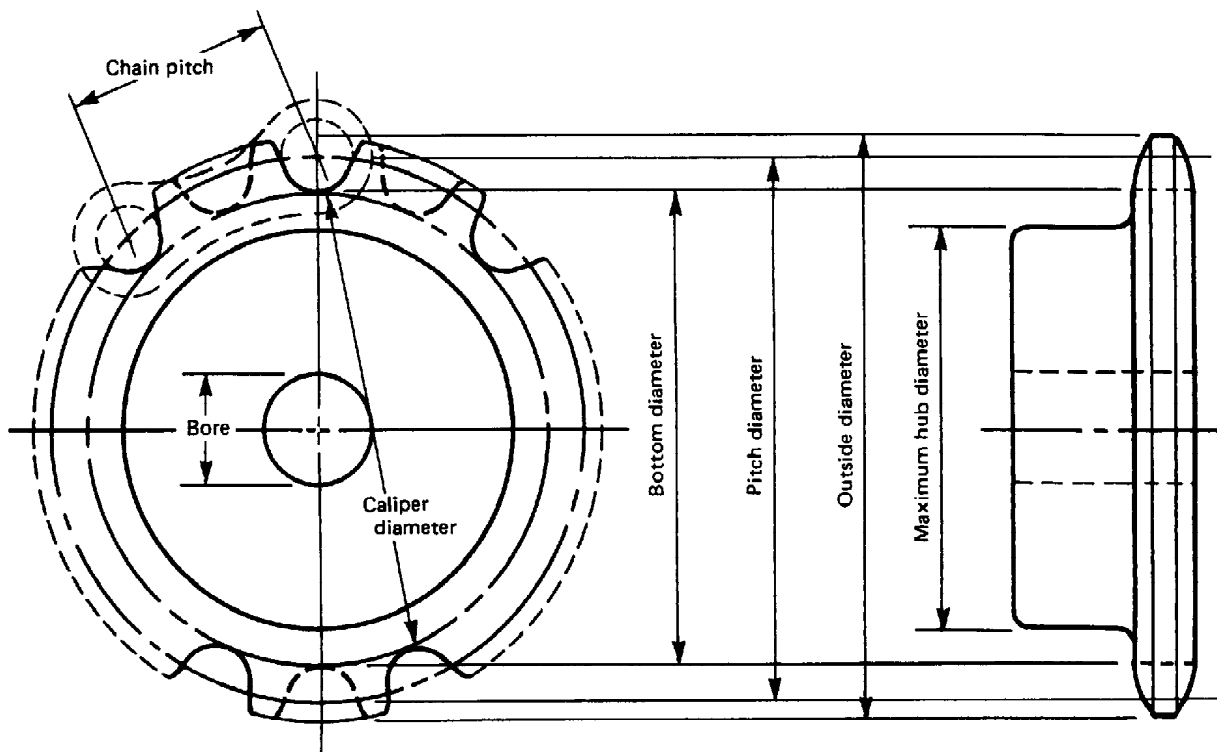
= $PD + P/2 [0.6 - (\tan 90 \text{ deg.}/N)]$

2.4 Tolerances for Diameters and Measuring Dimensions

See Tables 5A and 5B.

2.5 Tabulation of Diameters

See Table 6.



GENERAL NOTE: Effective teeth shown solid, extra set of tooth spaces is shown by broken lines.

FIG. 4 SPROCKET DIAMETERS

TABLE 4A
MAXIMUM ECCENTRICITY AND FACE RUNOUT TOLERANCES FOR
COMMERCIAL SPROCKETS (MEASURED AS TOTAL INDICATOR READING), in.

Sprocket Bottom Diameter, <i>BD</i>	Maximum Eccentricity	Maximum Face Runout
0- 7.000	0.010 + 0.001 (<i>BD</i>)	0.020
7.001-20.000	0.010 + 0.001 (<i>BD</i>)	0.003 (<i>BD</i>)
20.001-30.000	0.030	0.003 (<i>BD</i>)
30.001 and up	0.030	0.090

TABLE 4B
MAXIMUM ECCENTRICITY AND FACE RUNOUT TOLERANCES FOR
COMMERCIAL SPROCKETS (MEASURED AS TOTAL INDICATOR READING), mm

Sprocket Bottom Diameter, <i>BD</i>	Maximum Eccentricity	Maximum Face Runout
0-177.80	0.25 + 0.001 (<i>BD</i>)	0.51
177.81-508.00	0.25 + 0.001 (<i>BD</i>)	0.003 (<i>BD</i>)
508.01-762.00	0.76	0.003 (<i>BD</i>)
762.01 and up	0.76	2.29

TABLE 5A
MINUS¹ TOLERANCES ON THE BOTTOM OR CALIPER DIAMETERS
OF SPROCKETS FOR VARIOUS NUMBERS OF EFFECTIVE TEETH, in.

Chain No.	Chain Pitch, <i>P</i>	Number of Teeth, <i>N</i>				
		Up to 15½	16-24½	25-35½	36-48½	49-60
2040	1.000	0.012	0.014	0.016	0.018	0.020
2050	1.250	0.014	0.015	0.019	0.021	0.024
2060	1.500	0.015	0.018	0.021	0.024	0.027
2080	2.000	0.018	0.022	0.026	0.030	0.034
2100	2.500	0.021	0.026	0.031	0.036	0.041
2120	3.000	0.024	0.030	0.036	0.042	0.048

NOTE:

(1) No plus tolerance.

TABLE 5B
MINUS¹ TOLERANCES ON THE BOTTOM OR CALIPER DIAMETERS
OF SPROCKETS FOR VARIOUS NUMBERS OF EFFECTIVE TEETH, mm

Chain No.	Chain Pitch, <i>P</i>	Number of Teeth, <i>N</i>				
		Up to 15½	16-24½	25-35½	36-48½	49-60
2040	25.40	0.30	0.36	0.41	0.46	0.51
2050	31.80	0.36	0.41	0.48	0.53	0.61
2060	38.10	0.38	0.46	0.53	0.61	0.69
2080	50.80	0.46	0.56	0.66	0.76	0.86
2100	63.50	0.53	0.66	0.79	0.91	1.04
2120	76.20	0.61	0.76	0.91	1.07	1.22

NOTE:

(1) No plus tolerance.

TABLE 6
STANDARD PITCH DIAMETERS, OUTSIDE DIAMETERS, AND CALIPER DIAMETER
SINGLE-CUT SPROCKETS WHERE THE NUMBER OF EFFECTIVE TEETH
IS ODD, AND DOUBLE-CUT SPROCKETS WHERE THE NUMBER
OF EFFECTIVE TEETH IS FRACTIONAL
(For Unity Pitch Roller Chains)

No. of Effective Teeth	Pitch Diameter	Approximate Outside Diameter	Caliper Diameter Factor	
			Single-Cut (<i>N</i> is Odd)	Double-Cut (<i>N</i> is Fractional)
5	1.7013	1.839	1.6180	...
5½	1.8496	2.003	...	1.8308
6	2.0000	2.166	...	...
6½	2.1519	2.329	...	2.1361
7	2.3048	2.491	2.2470	...
7½	2.4586	2.652	...	2.4451
8	2.6131	2.814	...	...
8½	2.7682	2.975	...	2.7564
9	2.9238	3.136	2.8794	...
9½	3.0798	3.296	...	3.0692
10	3.2361	3.457	...	...
10½	3.3927	3.617	...	3.3831
11	3.5495	3.778	3.5133	...
11½	3.7065	3.938	...	3.6978
12	3.8637	4.098	...	...
12½	4.0211	4.258	...	4.0131
13	4.1786	4.418	4.1481	...
13½	4.3362	4.578	...	4.3289
14	4.4940	4.738	...	...
14½	4.6518	4.897	...	4.6450
15	4.8097	5.057	4.7834	...
15½	4.9677	5.217	...	4.9614
16	5.1258	5.377	...	...
16½	5.2840	5.536	...	5.2780
17	5.4422	5.695	5.4190	...
17½	5.6005	5.855	...	5.5948
18	5.7588	6.015	...	...
18½	5.9171	6.175	...	5.9118
19	6.0755	6.334	6.0548	...
19½	6.2340	6.494	...	6.2289
20	6.3924	6.653	...	...
20½	6.5509	6.813	...	6.5461
21	6.7095	6.972	6.6907	...
21½	6.8681	7.131	...	6.8635
22	7.0267	7.291	...	...
22½	7.1853	7.450	...	7.1809
23	7.3439	7.610	7.3268	...
23½	7.5026	7.769	...	7.4984
24	7.6613	7.929	...	...
24½	7.8200	8.088	...	7.8160
25	7.9787	8.247	7.9630	...
25½	8.1375	8.407	...	8.1336

(Table 6 continues on next page)

TABLE 6 (CONT'D)
STANDARD PITCH DIAMETERS, OUTSIDE DIAMETERS, AND CALIPER DIAMETER
SINGLE-CUT SPROCKETS WHERE THE NUMBER OF EFFECTIVE TEETH
IS ODD, AND DOUBLE-CUT SPROCKETS WHERE THE NUMBER
OF EFFECTIVE TEETH IS FRACTIONAL
(For Unity Pitch Roller Chains)

No. of Effective Teeth	Pitch Diameter	Approximate Outside Diameter	Caliper Diameter Factor	
			Single-Cut (<i>N</i> is Odd)	Double-Cut (<i>N</i> is Fractional)
26	8.2962	8.566	...	...
26½	8.4550	8.725	...	8.4513
27	8.6138	8.884	8.5992	...
27½	8.7726	9.044	...	8.7690
28	8.9314	9.203	...	...
28½	9.0902	9.363	...	9.0868
29	9.2491	9.522	9.2355	...
29½	9.4080	9.681	...	9.4046
30	9.5668	9.841	...	...
30½	9.7256	10.000	...	9.7224
31	9.8845	10.159	9.8718	...
31½	10.0434	10.318	...	10.0403
32	10.2023	10.478	...	...
32½	10.3612	10.637	...	10.3582
33	10.5201	10.796	10.5082	...
33½	10.6790	10.956	...	10.6761
34	10.8379	11.115	...	...
34½	10.9969	11.274	...	10.9940
35	11.1558	11.433	11.1446	...
35½	11.3148	11.593	...	11.3120
36	11.4737	11.752	...	...
36½	11.6237	11.911	...	11.6300
37	11.7916	12.070	11.7810	...
37½	11.9506	12.230	...	11.9480
38	12.1095	12.389	...	...
38½	12.2685	12.548	...	12.2660
39	12.4275	12.707	12.4174	...
39½	12.5865	12.867	...	12.5840
40	12.7455	13.026	...	...
40½	12.9045	13.185	...	12.9021
41	13.0635	13.344	13.0539	...
41½	13.2225	13.504	...	13.2201
42	13.3815	13.663	...	...
42½	13.5405	13.822	...	13.5382
43	13.6995	13.981	13.6904	...
43½	13.8585	14.140	...	13.8563
44	14.0175	14.300	...	...
44½	14.1765	14.459	...	14.1744
45	14.3355	14.618	14.3269	...
45½	14.4946	14.777	...	14.4925
46	14.6536	14.937	...	...
46½	14.8127	15.096	...	14.8106

TABLE 6 (CONT'D)
STANDARD PITCH DIAMETERS, OUTSIDE DIAMETERS, AND CALIPER DIAMETER
SINGLE-CUT SPROCKETS WHERE THE NUMBER OF EFFECTIVE TEETH
IS ODD, AND DOUBLE-CUT SPROCKETS WHERE THE NUMBER
OF EFFECTIVE TEETH IS FRACTIONAL
(For Unity Pitch Roller Chains)

No. of Effective Teeth	Pitch Diameter	Approximate Outside Diameter	Caliper Diameter Factor	
			Single-Cut (<i>N</i> is Odd)	Double-Cut (<i>N</i> is Fractional)
47	14.9717	15.255	14.9634	...
47½	15.1308	15.414	...	15.1287
48	15.2898	15.573	...	...
48½	15.4488	15.733	...	15.4468
49	15.6079	15.892	15.5999	...
49½	15.7669	16.051	...	15.7649
50	15.9260	16.210	...	...
50½	16.0860	16.369	...	16.0831
51	16.2441	16.529	16.2364	...
51½	16.4031	16.688	...	16.4012
52	16.5622	16.847	...	...
52½	16.7212	17.006	...	16.7194
53	16.8803	17.165	16.8729	...
53½	17.0393	17.325	...	17.0375
54	17.1984	17.484	...	...
54½	17.3575	17.643	...	17.3557
55	17.5165	17.802	17.5094	...
55½	17.6756	17.961	...	17.6739
56	17.8347	18.121	...	...
56½	17.9938	18.280	...	17.9920
57	18.1528	18.439	18.1459	...
57½	18.3119	18.598	...	18.3102
58	18.4710	18.757	...	...
58½	18.6301	18.917	...	18.6284
59	18.7892	19.076	18.7825	...
59½	18.9482	19.235	...	18.9466
60	19.1073	19.394	...	...

GENERAL NOTES:**(a) For other chain pitches:**

Pitch diameter = pitch diameter from Table 6 × chain pitch

Outside diameter = outside diameter from Table 6 × chain pitch

(b) Caliper diameter factor for:Single-cut, if *N* is an odd number = $PD \cos (90 \text{ deg.}/N)$ Double-cut, if *N* is a fractional number = $PD \cos (45 \text{ deg.}/N)$ **(c) Caliper diameter for:**

Single-cut, if *N* is an odd number
 Double-cut, if *N* is a fractional number } = (caliper diameter factor from Table 6 × chain pitch) – roller diameter

Single-cut, if *N* is an even number
 Double-cut, if *N* is an odd or even number } = pitch diameter – roller diameter

APPENDIX A

SUPPLEMENTARY INFORMATION¹

(This Appendix is not part of ASME B29.3M-1994, and is included for information purposes only.)

A1 CHAIN SELECTION

A1.1 Design Factors

The horsepower ratings in Tables A2 through A7 generally apply to lubricated double-pitch roller chains described in the preceding Standard. The ratings reflect a service factor of one (1), the use of recommended lubrication methods, and a drive arrangement where two aligned sprockets are mounted on parallel shafts in a horizontal plane. Under these conditions, approximately 15,000 hr of service life at full load operation may generally be expected.

It is beyond the scope of this publication to present selection procedures for all conditions. Consult chain manufacturers for assistance with any special application requirements.

A1.2 Service Factors

Service factors as given in the following tabulation should be used in connection with the horsepower ratings, the load capacity being multiplied by the factor to obtain the desired chain capacity.

Type of Load	Conditions of Service	
	10 hr Day	24 hr Day
Uniform load — average conditions	1.0	1.2
Moderate shock — abnormal conditions	1.2	1.4
Heavy shock — abnormal conditions	1.4	1.7

¹Made available through the cooperation of the American Chain Association.

A1.3 Lubrication

Lubrication of roller chains is essential for effectively minimizing metal-to-metal contact of pin-bushing joints of the chain. Oil should be applied to link plate edges as subsequently explained under Type I method of lubrication, since access to pin-bushing clearances is possible only through clearances between pin link plates and roller link plates. Oil applied on center line of rollers can not reach pin-bushing joints and therefore cannot retard chain wear elongation.

A good grade of mineral oil, without additives, of medium or light consistency, free flowing at the prevailing temperature, should be used.

Lubrication	
Temperature, °F	Recommended Lubricant
20- 40	SAE 20
40-100	SAE 30
100-120	SAE 40
120-140	SAE 50

Drives should be protected against dirt and moisture. The method of lubrication, which is influenced by the speed of the chain and the amount of power transmitted, should be in accordance with one of the following:

Type I — drip (4 to 10 drops per minute), shallow bath, or manual with oil applied frequently with a brush or spout can to upper edges of all link plates when in the lower span of chain²

Type II — rapid drip (20 drops per minute minimum) or continuous with shallow bath, disk, or slinger²

Type III — continuous, with disk, slinger, or circulating pump

The choice of method or type of lubrication should in general be guided by the following:

²A circulating pump may be required when transmitted horsepower is substantial and center distance is short.

Chain Speed	Method of Lubrication
Up to 600 ft/min (3 m/s)	Type I
600 to 1500 ft/min (3 to 7.6 m/s)	Type II
Above 1500 ft/min (7.6 m/s)	Type III

Heavy oils and greases are not recommended for lubrication of roller chains except under unusual conditions of service because they are generally too stiff to enter and fill the small clearances between the chain parts. Engineers of chain manufacturers should be consulted in regard to lubrication of roller chain drives for which lubrication other than as outlined might seem to be desirable.

A1.4 Sprockets

Sprockets should have tooth shape, thickness, profile, and diameters conforming to these standards. Small sprockets, 17 effective teeth and less, will preferably be of steel, 180 Brinell minimum for speeds to about 600 ft/min. For speeds greater than 600 ft/min, either 0.20 carbon steel, carburized, hardened, and drawn, or 0.40 or higher carbon steel, heat treated and drawn are generally recommended, the hardness usually being between 300 Brinell minimum and 550 Brinell maximum depending on the type of service.

Larger sprockets may be made from unhardened steel plates, bars, castings, forgings, or cast iron, depending upon the duty imposed.

A1.5 Center Distance

Center distance between sprockets should be sufficient to provide approximately 135 deg. minimum arc of meshing of the chain on the smaller sprocket. Means for

adjustment of center distance is recommended especially if there is fluctuation of load or if the sprockets are on vertical centers.

A1.6 Alignment

Alignment of shafting and sprocket tooth faces must be such as to provide distribution of the load across the entire chain width. Shaftings, bearings, and foundations should be suitable to maintain the initial static alignment.

NOTE: The horsepower tables are directly applicable only if the sprockets are on parallel, horizontal shafts.

A1.7 Sprocket Cutter Selection

The tooth space form for double-pitch chain sprockets is basically the same as that for the respective base chain series. ASME B29.1M-1993 covers tooth space form and cutter design for the base chain series sprockets.

When cutting double-pitch sprockets with a tooth space cutter, it is necessary to use the space cutter for the base chain series but having the next higher range of teeth than the number of effective teeth to be cut.

EXAMPLE: 15 Teeth No. 2080 – A No. 80 space cutter having a range of 18–34 teeth should be used instead of the 12–17 tooth range.

When cutting double-pitch sprockets with a base chain hob or fellows cutter, it is necessary to cut an extra set or a double number of teeth resulting in two sets of teeth. The chain will engage with only one set of teeth.

TABLE A1
RECOMMENDED MAXIMUM RPM FOR SPROCKETS

No. of Effective Teeth	Chain No. (Pitch, in.)					
	2040 (1)	2050 (1 1/4)	2060 (1 1/2)	2080 (2)	2100 (2 1/2)	2120 (3)
6	85	60	45	30	20	15
7	200	145	110	70	50	40
8	320	230	175	110	80	60
9	440	315	240	150	110	80
10	555	400	300	190	135	105
11	660	475	360	225	160	125
12	755	545	410	260	185	145
13	850	610	460	290	210	165
14	930	670	505	320	230	180
15	1000	720	540	345	245	195
16	1060	765	575	365	260	205
17	1115	805	605	385	275	215
18	1160	835	630	400	285	225
19	1200	865	650	415	295	230
20	1230	890	670	425	305	235
21	1260	910	685	435	310	240
22	1280	925	695	440	315	245
23	1300	935	705	445	320	250
24	1310	945	710	450	325	250
25	1320	950	715	450	330	255
30	1310	945	715	450	325	250
35	1255	905	680	435	310	240
40	1160	835	630	400	285	220
45	1040	750	565	360	255	200
50	910	655	495	315	225	175
55	770	555	415	265	185	145
60	615	445	335	210	150	120

TABLE A2
HORSEPOWER RATINGS DOUBLE-PITCH POWER TRANSMISSION ROLLER CHAIN — NO. 2040

NO. OF EFFEC- TIVE TEETH IN SMALL SPKT.	1 in. Pitch																	NO. OF EFFEC- TIVE TEETH IN SMALL SPKT.						
	REVOLUTIONS PER MINUTE - SMALL SPROCKET																							
	25	50	100	150	200	250	300	350	400	450	500	550	600	700	800	900	1000		1100	1200	1300			
6	0.10	0.17																			6			
7	0.12	0.21	0.35	0.46	0.54																7			
8	0.14	0.25	0.45	0.64	0.72	0.82	0.90														8			
9	0.16	0.30	0.53	0.72	0.88	1.02	1.14	1.3	1.3												9			
10	0.18	0.34	0.61	0.82	1.04	1.21	1.37	1.5	1.6	1.7	1.8	1.9									10			
11	0.20	0.38	0.69	0.96	1.20	1.41	1.59	1.8	1.9	2.0	2.1	2.2	2.3								11			
12	0.22	0.42	0.77	1.07	1.34	1.58	1.80	2.0	2.2	2.3	2.5	2.6	2.7	2.9							12			
13	0.24	0.46	0.84	1.18	1.48	1.76	2.01	2.2	2.4	2.6	2.8	2.9	3.1	3.3	3.5						13			
14	0.26	0.50	0.92	1.29	1.62	1.93	2.21	2.5	2.7	2.9	3.1	3.3	3.4	3.7	3.9	4.1					14			
15	0.28	0.54	0.99	1.39	1.76	2.09	2.40	2.7	2.9	3.2	3.4	3.6	3.8	4.1	4.3	4.5	4.7				15			
16	0.30	0.57	1.06	1.50	1.89	2.25	2.59	2.9	3.2	3.4	3.7	3.9	4.1	4.4	4.7	5.0	5.1				16			
17	0.32	0.61	1.13	1.60	2.02	2.41	2.77	3.1	3.4	3.7	4.0	4.2	4.4	4.8	5.1	5.4	5.6	5.7			17			
18	0.34	0.65	1.20	1.70	2.15	2.57	2.95	3.3	3.6	3.9	4.2	4.5	4.7	5.1	5.5	5.8	6.0	6.2			18			
19	0.36	0.69	1.27	1.80	2.28	2.73	3.13	3.5	3.9	4.2	4.5	4.8	5.0	5.5	5.9	6.2	6.4	6.6	6.7		19			
20	0.38	0.72	1.34	1.89	2.40	2.87	3.30	3.7	4.1	4.4	4.7	5.0	5.3	5.8	6.2	6.5	6.8	7.0	7.1		20			
21	0.40	0.76	1.41	1.99	2.53	3.01	3.47	3.9	4.3	4.6	5.0	5.3	5.6	6.1	6.5	6.9	7.1	7.4	7.5		21			
22	0.42	0.79	1.48	2.09	2.64	3.16	3.63	4.1	4.5	4.9	5.2	5.5	5.8	6.4	6.8	7.2	7.5	7.7	7.9		22			
23	0.44	0.83	1.54	2.18	2.76	3.30	3.80	4.3	4.7	5.1	5.4	5.8	6.1	6.6	7.1	7.5	7.8	8.0	8.2	8.3	23			
24	0.46	0.87	1.61	2.27	2.88	3.44	3.95	4.4	4.9	5.3	5.7	6.0	6.4	6.9	7.4	7.8	8.1	8.4	8.5	8.6	24			
25	0.48	0.90	1.67	2.36	3.00	3.58	4.11	4.6	5.1	5.5	5.9	6.3	6.6	7.2	7.7	8.1	8.4	8.7	8.8	8.9	25			
30	0.57	1.08	1.99	2.81	3.56	4.24	4.87	5.4	6.0	6.5	6.9	7.4	7.8	8.4	8.9	9.4	9.7	10.0	10.1	10.1	30			
35	0.66	1.25	2.30	3.24	4.09	4.86	5.57	6.2	6.8	7.4	7.9	8.3	8.7	9.4	10.0	10.4	10.7	10.9	11.0		35			
40	0.75	1.41	2.60	3.65	4.59	5.45	6.22	6.9	7.6	8.2	8.7	9.2	9.6	10.3	10.9	11.2	11.5	11.6			40			
45	0.84	1.58	2.89	4.04	5.07	6.00	6.84	7.6	8.3	8.9	9.4	9.9	10.3	11.0	11.6	11.9	12.0				45			
50	0.93	1.74	3.17	4.42	5.53	6.52	7.41	8.2	8.9	9.6	10.1	10.6	11.0	11.7	12.1	12.3					50			
55	1.01	1.90	3.45	4.79	5.97	7.02	7.95	8.8	9.5	10.2	10.7	11.2	11.6	12.2							55			
60	1.10	2.05	3.70	5.14	6.39	7.49	8.46	9.3	10.0	10.7	11.2	11.7	12.0								60			
TYPE I LUBRICATION																	TYPE II LUBRICATION				TYPE III LUBRICATION			

TYPE I: Drip (4 to 10 drops per minute), shallow bath, or manual with oil applied frequently with a brush or spout can to upper edges of all link plates when in the lower span of chain.

TYPE II: Rapid drip (20 drops per minute minimum), or continuous with shallow bath, disk, or slinger.

TYPE III: Continuous with disk, slinger, or circulating pump.

TABLE A3
HORSEPOWER RATINGS DOUBLE-PITCH POWER TRANSMISSION ROLLER CHAIN — NO. 2050

1-1/4 in. Pitch

NO. OF EFFEC- TIVE TEETH IN SMALL SPKT.	REVOLUTIONS PER MINUTE — SMALL SPROCKET																			NO. OF EFFEC- TIVE TEETH IN SMALL SPKT.	
	25	50	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800	850	900		950
6	0.18	0.31																			6
7	0.22	0.40	0.65																		7
8	0.26	0.48	0.82	1.08	1.28																8
9	0.31	0.56	0.98	1.32	1.59	1.82	1.99														9
10	0.35	0.64	1.14	1.55	1.89	2.19	2.42	2.62	2.80												10
11	0.39	0.72	1.30	1.77	2.19	2.55	2.85	3.11	3.35	3.55											11
12	0.43	0.80	1.45	1.99	2.47	2.90	3.26	3.58	3.88	4.12	4.31										12
13	0.47	0.88	1.59	2.20	2.74	3.23	3.65	4.03	4.38	4.66	4.90	5.11	5.30								13
14	0.51	0.95	1.73	2.41	3.01	3.55	4.02	4.45	4.85	5.17	5.47	5.73	5.95	6.09							14
15	0.55	1.02	1.87	2.62	3.27	3.87	4.37	4.86	5.30	5.67	6.01	6.31	6.57	6.75	6.94						15
16	0.58	1.09	2.01	2.82	3.52	4.17	4.72	5.25	5.73	6.15	6.53	6.87	7.17	7.39	7.61	7.79					16
17	0.62	1.17	2.14	3.01	3.77	4.46	5.07	5.67	6.15	6.61	7.05	7.42	7.74	7.99	8.24	8.46	8.62				17
18	0.66	1.24	2.27	3.20	4.01	4.75	5.41	6.04	6.56	7.07	7.54	7.95	8.29	8.56	8.84	9.08	9.28				18
19	0.70	1.31	2.40	3.39	4.25	5.04	5.75	6.40	6.96	7.51	8.01	8.46	8.82	9.12	9.42	9.68	9.90	10.08			19
20	0.74	1.38	2.53	3.57	4.48	5.32	6.07	6.75	7.35	7.94	8.46	8.94	9.33	9.65	9.97	10.25	10.49	10.69			20
21	0.77	1.45	2.66	3.75	4.71	5.59	6.38	7.10	7.74	8.36	8.90	9.40	9.82	10.16	10.50	10.80	11.06	11.28	11.44		21
22	0.81	1.52	2.79	3.92	4.93	5.85	6.69	7.44	8.12	8.77	9.33	9.84	10.29	10.65	11.01	11.32	11.59	11.83	12.00		22
23	0.84	1.59	2.92	4.10	5.15	6.11	6.99	7.77	8.49	9.16	9.75	10.27	10.74	11.12	11.50	11.82	12.10	12.35	12.53		23
24	0.88	1.66	3.05	4.27	5.37	6.37	7.29	8.10	8.85	9.54	10.16	10.70	11.18	11.57	11.97	12.30	12.59	12.85	13.03		24
25	0.91	1.72	3.17	4.45	5.59	6.62	7.57	8.42	9.20	9.91	10.56	11.12	11.61	12.01	12.42	12.75	13.05	13.33	13.50	13.57	25
30	1.09	2.05	3.77	5.29	6.62	7.82	8.92	9.92	10.80	11.65	12.32	12.99	13.55	13.96	14.39	14.76	15.06	15.30	15.48		30
35	1.27	2.38	4.35	6.07	7.60	8.95	10.20	11.27	12.25	13.12	13.90	14.59	15.17	15.58	16.00	16.35	16.62	16.82	16.94		35
40	1.44	2.70	4.90	6.82	8.50	10.02	11.32	12.51	13.55	14.45	15.25	15.95	16.57	16.92	17.29	17.58	17.78				40
45	1.61	3.00	5.45	7.55	9.35	11.00	12.40	13.65	14.70	15.62	16.45	17.14	17.67	17.96	18.29	18.49					45
50	1.78	3.30	5.95	8.25	10.17	11.90	13.40	14.68	15.75	16.70	17.55	18.08	18.55	18.80							50
55	1.95	3.60	6.45	8.90	10.95	12.75	14.30	15.60	16.67	17.57	18.37	18.91									55
60	2.11	3.90	6.95	9.52	11.70	13.55	15.12	16.45	17.54												60
TYPE I LUBRICATION		TYPE II LUBRICATION										TYPE III LUBRICATION									

TYPE I Drip (4 to 10 drops per minute), shallow bath, or manual with oil applied frequently with a brush or spout can to upper edges of all link plates when in the lower span of chain.
TYPE II Rapid drip (20 drops per minute minimum), or continuous with shallow bath, disk, or sling.
TYPE III Continuous with disk, sling, or circulating pump.

TABLE A5
HORSEPOWER RATINGS DOUBLE-PITCH POWER TRANSMISSION ROLLER CHAIN — NO. 2080

NO. OF EFFEC- TIVE TEETH IN SMALL SPKT.	2 in. Pitch																				NO. OF EFFEC- TIVE TEETH IN SMALL SPKT.
	REVOLUTIONS PER MINUTE — SMALL SPROCKET																				
	10	20	30	40	50	60	70	80	90	100	125	150	175	200	225	250	300	350	400	450	
6	0.32	0.55	0.76																		6
7	0.38	0.70	0.98	1.22	1.44	1.63	1.80														7
8	0.46	0.84	1.18	1.50	1.78	2.04	2.28	2.50	2.70	2.88											8
9	0.52	0.98	1.39	1.76	2.11	2.43	2.74	3.02	3.29	3.53	4.08	4.54									9
10	0.59	1.11	1.58	2.02	2.43	2.82	3.18	3.53	3.85	4.16	4.85	5.45	5.98								10
11	0.66	1.24	1.77	2.27	2.76	3.20	3.60	4.02	4.38	4.77	5.60	6.33	6.98	7.56	8.07						11
12	0.72	1.37	1.96	2.52	3.08	3.56	4.02	4.50	4.92	5.36	6.33	7.19	7.95	8.66	9.27	9.82					12
13	0.79	1.49	2.15	2.77	3.38	3.91	4.44	4.97	5.45	5.93	7.02	8.02	8.89	9.72	10.42	11.08					13
14	0.85	1.62	2.33	3.01	3.67	4.26	4.85	5.42	5.96	6.49	7.69	8.82	9.80	10.74	11.53	12.29	13.60				14
15	0.91	1.74	2.52	3.25	3.96	4.60	5.25	5.86	6.45	7.03	8.34	9.60	10.68	11.73	12.60	13.46	14.94				15
16	0.98	1.87	2.70	3.48	4.24	4.94	5.64	6.29	6.93	7.56	8.98	10.36	11.53	12.69	13.63	14.59	16.24	17.65			16
17	1.04	1.99	2.88	3.71	4.52	5.28	6.02	6.72	7.40	8.09	9.61	11.10	12.36	13.62	14.63	15.69	17.50	19.04			17
18	1.11	2.11	3.05	3.94	4.80	5.61	6.40	7.14	7.87	8.60	10.23	11.82	13.18	14.52	15.60	16.76	18.72	20.38	21.77		18
19	1.17	2.23	3.23	4.17	5.08	5.94	6.77	7.56	8.33	9.10	10.84	12.52	13.98	15.39	16.55	17.80	19.90	21.67	23.18		19
20	1.23	2.35	3.40	4.40	5.35	6.26	7.13	7.98	8.78	9.60	11.44	13.20	14.76	16.24	17.48	18.81	21.04	22.91	24.52		20
21	1.29	2.47	3.57	4.62	5.62	6.58	7.49	8.39	9.23	10.09	12.03	13.87	15.52	17.07	18.39	19.79	22.14	24.11	25.80		21
22	1.36	2.58	3.74	4.84	5.89	6.89	7.84	8.79	9.67	10.57	12.62	14.53	16.27	17.89	19.28	20.74	23.20	25.27	27.03		22
23	1.42	2.70	3.90	5.06	6.16	7.20	8.19	9.18	10.10	11.05	13.20	15.18	17.01	18.70	20.15	21.66	24.23	26.40	28.22		23
24	1.48	2.82	4.05	5.27	6.43	7.51	8.54	9.56	10.53	11.52	13.77	15.82	17.74	19.50	21.01	22.55	25.23	27.50	29.38	30.98	24
25	1.54	2.93	4.20	5.48	6.70	7.81	8.89	9.94	10.95	11.98	14.33	16.45	18.46	20.29	21.86	23.42	26.20	28.57	30.52	32.16	25
30	1.84	3.50	5.02	6.54	7.96	9.29	10.59	11.74	12.97	14.23	16.98	19.46	21.79	23.91	25.73	27.52	30.70	33.56	35.52	37.26	30
35	2.14	4.07	5.82	7.56	9.19	10.71	12.21	13.48	14.92	16.35	19.46	22.26	24.86	27.23	29.24	31.21	34.65	37.57	39.66		35
40	2.43	4.61	6.60	8.55	10.38	12.09	13.76	15.17	16.80	18.36	21.79	24.88	27.71	30.28	32.42	34.52	38.09	40.96	43.07		40
45	2.72	5.15	7.37	9.52	11.54	13.43	15.25	16.82	18.61	20.28	23.99	27.34	30.36	33.08	35.30	37.50	41.10	43.81			45
50	3.01	5.68	8.13	10.47	12.67	14.73	16.69	18.43	20.35	22.12	26.08	29.65	32.82	35.65	37.92	40.16	43.70				50
55	3.29	6.20	8.88	11.40	13.78	15.99	18.08	20.00	22.02	23.88	28.07	31.82	35.10	38.00	40.30	42.52					55
60	3.57	6.72	9.60	12.31	14.88	17.21	19.43	21.53	23.62	25.57	29.97	33.86	37.21	40.14							60
	TYPE I LUBRICATION										TYPE II LUBRICATION					TYPE III LUBRICATION					

TYPE I Drip (4 to 10 drops per minute), shallow bath, or manual with oil applied frequently with a brush or spout can to upper edges of all link plates when in the lower span of chain.
 TYPE II Rapid drip (20 drops per minute minimum), or continuous with shallow bath, disk, or slinger
 TYPE III Continuous with disk, slinger, or circulating pump.

TABLE A6
HORSEPOWER RATINGS DOUBLE-PITCH POWER TRANSMISSION ROLLER CHAIN — NO. 2100

2-1/2 in. Pitch

NO. OF EFFEC- TIVE TEETH IN SMALL SPKT.	REVOLUTIONS PER MINUTE - SMALL SPROCKET																				NO. OF EFFEC- TIVE TEETH IN SMALL SPKT.
	10	20	30	40	50	60	70	80	100	120	140	160	180	200	220	240	260	280	300	325	
6	0.60	1.04																			6
7	0.74	1.32	1.82	2.25	2.62																7
8	0.87	1.59	2.22	2.78	3.29	3.74	4.14	4.51													8
9	1.00	1.85	2.61	3.30	3.93	4.51	5.04	5.52													9
10	1.13	2.11	2.99	3.80	4.55	5.25	5.89	6.50	7.58	8.51											10
11	1.26	2.36	3.37	4.29	5.15	5.96	6.72	7.45	8.74	9.87	10.91	11.81									11
12	1.39	2.61	3.74	4.77	5.74	6.65	7.53	8.36	9.86	11.21	12.40	13.53	14.49								12
13	1.52	2.86	4.10	5.25	6.32	7.33	8.32	9.24	10.95	12.51	13.85	15.18	16.30	17.33							13
14	1.64	3.10	4.45	5.72	6.90	8.00	9.09	10.09	12.00	13.77	15.26	16.76	18.04	19.23	20.31						14
15	1.76	3.34	4.80	6.18	7.47	8.66	9.84	10.92	13.02	14.98	16.63	18.28	19.72	21.06	22.29	23.40					15
16	1.88	3.57	5.14	6.63	8.03	9.31	10.57	11.73	14.02	16.14	17.97	19.75	21.35	22.83	24.21	25.43	26.56				16
17	2.00	3.80	5.48	7.07	8.58	9.95	11.30	12.54	15.00	17.27	19.28	21.17	22.93	24.54	26.09	27.39	28.63				17
18	2.12	4.03	5.82	7.50	9.12	10.58	12.02	13.34	15.96	18.38	20.56	22.55	24.47	26.20	27.89	29.28	30.63	31.87			18
19	2.24	4.26	6.15	7.92	9.65	11.20	12.73	14.13	16.90	19.47	21.81	23.90	25.96	27.81	29.63	31.11	32.56	33.89			19
20	2.36	4.49	6.48	8.34	10.17	11.81	13.43	14.91	17.82	20.54	23.02	25.23	27.41	29.38	31.31	32.88	34.42	35.84	37.14		20
21	2.48	4.72	6.81	8.76	10.68	12.41	14.12	15.68	18.73	21.59	24.20	26.54	28.82	30.91	32.94	34.59	36.22	37.72	39.10		21
22	2.60	4.95	7.14	9.17	11.18	13.00	14.80	16.44	19.63	22.62	25.35	27.83	30.20	32.29	34.52	36.25	37.97	39.54	40.99		22
23	2.72	5.17	7.46	9.58	11.67	13.58	15.47	17.19	20.52	23.64	26.48	29.10	31.55	33.83	36.05	37.86	39.66	41.30	42.81		23
24	2.84	5.39	7.78	9.99	12.15	14.16	16.13	17.93	21.40	24.65	27.59	30.35	32.88	35.25	37.54	39.43	41.30	43.00	44.56	46.31	24
25	2.96	5.61	8.09	10.40	12.63	14.73	16.78	18.66	22.27	25.65	28.68	31.54	34.19	36.65	39.00	40.96	42.89	44.65	46.25	48.06	25
30	3.54	6.71	9.65	12.39	15.03	17.50	19.88	22.26	26.50	30.32	33.90	37.02	40.25	43.05	45.70	48.00	50.16	52.13	53.90	55.88	30
35	4.11	7.78	11.16	14.30	17.33	20.17	20.86	25.63	30.40	34.60	38.74	42.14	45.72	48.79	51.65	54.15	56.44	58.51	60.35		35
40	4.67	8.82	12.63	16.15	19.55	22.74	25.72	28.79	34.02	38.62	43.22	46.88	50.68	53.95	56.92	59.53	61.87	63.94			40
45	5.22	9.84	14.06	17.95	21.70	25.21	28.46	31.76	37.41	42.39	47.36	51.27	55.19	58.58	61.58	64.22					45
50	5.76	10.84	15.46	19.71	23.78	27.58	31.09	34.56	40.62	45.95	51.18	55.32	59.28	62.71	65.70						50
55	6.29	11.82	16.83	21.44	25.80	29.86	33.61	37.20	43.70	49.34	54.69	59.03	62.99								55
60	6.82	12.78	18.17	23.14	27.76	32.05	36.03	39.68	46.69	52.60	57.89										60
															</						

TYPE III LUBRICATION

TYPE II LUBRICATION

TYPE I LUBRICATION

TYPE I: Drip (4 to 10 drops per minute), shallow bath, or manual with oil applied frequently with a brush or spout can to upper edges of all link plates when in the lower span of chain.
 TYPE II: Rapid drip (20 drops per minute minimum), or continuous with shallow bath, disk, or slinger.
 TYPE III: Continuous with disk, slinger, or circulating pump.

TABLE A7
HORSEPOWER RATINGS DOUBLE-PITCH POWER TRANSMISSION ROLLER CHAIN — NO. 2120

NO. OF EFFEC- TIVE TEETH IN SMALL SPKT.	3 in. Pitch																				NO. OF EFFEC- TIVE TEETH IN SMALL SPKT.									
	REVOLUTIONS PER MINUTE - SMALL SPROCKET																													
	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160	180	200	225	250										
6	1.00																				6									
7	1.24	2.20	3.00	3.67																	7									
8	1.47	2.67	3.70	4.59	5.38	6.08															8									
9	1.70	3.12	4.37	5.48	6.48	7.39	8.22	8.96													9									
10	1.93	3.56	5.02	6.34	7.55	8.66	9.68	10.62	11.48	12.28											10									
11	2.15	3.99	5.66	7.18	8.59	9.89	11.09	12.22	13.27	14.25	15.15	15.99									11									
12	2.37	4.42	6.29	7.98	9.60	11.08	12.47	13.77	15.00	16.14	17.21	18.22	19.16	20.04							12									
13	2.59	4.84	6.91	8.77	10.58	12.24	13.81	15.28	16.67	17.97	19.20	20.37	21.46	22.50	23.47	24.38					13									
14	2.80	5.25	7.52	9.54	11.54	13.38	15.11	16.75	18.29	19.75	21.13	22.45	23.68	24.87	25.98	27.03	28.95				14									
15	3.01	5.66	8.12	10.30	12.49	14.49	16.39	18.18	19.87	21.48	23.00	24.47	25.84	27.15	28.40	29.58	31.75				15									
16	3.22	6.06	8.71	11.06	13.42	15.58	17.63	19.57	21.42	23.16	24.82	26.43	27.94	29.37	30.74	32.05	34.45	36.62			16									
17	3.43	6.46	9.29	11.81	14.33	16.65	18.86	20.93	22.93	24.80	26.59	28.34	29.98	31.53	33.01	34.44	37.06	39.44			17									
18	3.64	6.86	9.86	12.55	15.23	17.71	20.06	22.27	24.41	26.41	28.33	30.20	31.96	33.63	35.22	36.76	39.58	42.16	45.02		18									
19	3.85	7.25	10.42	13.28	16.12	18.75	21.24	23.59	25.86	27.99	30.03	32.02	33.89	35.68	37.37	39.01	42.02	44.79	47.86		19									
20	4.05	7.64	10.98	14.01	16.99	19.77	22.40	24.89	27.28	29.54	31.70	33.80	35.78	37.68	39.47	41.20	44.39	47.34	50.60		20									
21	4.25	8.03	11.53	14.73	17.86	20.77	23.55	26.17	28.68	31.06	33.34	35.54	37.63	39.63	41.52	43.34	46.70	49.81	53.25		21									
22	4.45	8.41	12.08	15.45	18.72	21.76	24.67	27.43	30.06	32.56	34.95	37.25	39.44	41.53	43.52	45.43	48.95	52.21	55.82		22									
23	4.65	8.79	12.62	16.16	19.56	22.75	25.78	28.67	31.41	34.03	36.53	38.92	41.21	43.39	45.47	47.46	51.14	54.54	58.32	61.62	23									
24	4.85	9.17	13.16	16.86	20.39	23.72	26.87	29.89	32.74	35.47	38.07	40.56	42.94	45.21	47.37	49.44	53.27	56.80	60.75	64.15	24									
25	5.05	9.54	13.69	17.55	21.20	24.67	27.96	31.09	34.05	36.88	39.58	42.16	44.64	46.99	49.23	51.37	55.35	59.00	63.11	66.60	25									
30	6.00	11.38	16.30	20.90	25.22	29.30	33.16	36.83	40.31	43.62	46.76	49.78	52.65	55.37	57.95	60.42	64.96	69.12	73.70	77.62	30									
35	6.96	13.18	18.83	24.10	29.05	33.70	38.08	42.24	46.16	49.86	53.41	56.78	59.95	62.95	65.81	68.54	73.48	77.97	82.81		35									
40	7.91	14.94	21.29	27.16	32.72	37.89	42.75	47.34	51.66	55.74	59.59	63.24	66.67	69.90	72.95	75.85	81.06	85.72			40									
45	8.85	16.66	23.69	30.10	36.25	41.90	47.20	52.17	56.83	61.22	65.34	69.22	72.87	76.28	79.45	82.46	87.81	92.48			45									
50	9.78	18.34	26.03	32.94	39.65	45.75	51.44	56.75	61.72	66.37	70.71	74.77	78.58	82.10	85.36	88.40					50									
55	10.70	19.99	28.31	35.71	42.94	49.45	55.45	61.10	66.34	71.20	75.72	79.92	83.80	87.40							55									
60	11.61	21.61	30.54	38.46	46.12	53.00	59.24	65.25	70.70	75.74	80.39	84.68									60									
	TYPE I LUBRICATION										TYPE II LUBRICATION										TYPE III LUBRICATION									

TYPE I Drip (4 to 10 drops per minute), shallow bath, or manual with oil applied frequently with a brush or spout can to upper edges of all link plates when in the lower span of chain.

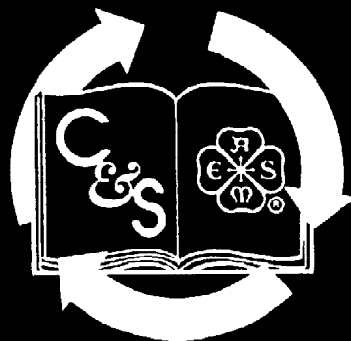
TYPE II Rapid drip (20 drops per minute minimum), or continuous with shallow bath, disk, or slinger.

TYPE III Continuous with disk, slinger, or circulating pump

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ISBN #0-7918-2268-0

K07594