ASME B29.1-2011

(Revision of ASME B29.1 and Partition From ASME B29.100-2002)

Precision Power Transmission Roller Chains, Attachments, and Sprockets

AN AMERICAN NATIONAL STANDARD

The American Society of Mechanical Engineers

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Three Park Avenue • New York, NY • 10016 USA

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The American Society of Mechanical Engineers
Three Park Avenue, New York, NY 10016-5990

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FOREWORD

The original design of precision roller chain dates back to the late 1890s, although various types of drive chains have been in use for centuries. The early automobiles used roller chains extensively as the final drive. The industrial use for roller chains grew substantially, resulting in the desirability of standardization. The perfected American standard chain of today has evolved to meet the demand for ever-increasing horsepower and higher speeds, as well as accurate timing.

In 1913, the Society of Automotive Engineers (SAE) published formulas for calculating the roller chain length, sprocket tooth profiles, and other important design criteria. Recommendations from the Roller Chain Committee of the American Society of Mechanical Engineers (ASME) followed in 1917 with dimensional standards for the various components and assemblies. Early in 1920, through the cooperation of these two groups, roller chain standards were formulated and recommended for acceptance by industry. The progress was followed in 1921 by organization of a sprocket committee of the American Gear Manufacturers Association (AGMA).

ASA Sectional Committee B29, Transmission Chain, Sprockets, and Cutters, was organized in 1924 by the American Standards Association with ASME, AGMA, and SAE as sponsors. A subcommittee on roller chains was established to study modern practices of roller chain manufacture and use. Its recommendations on standards were approved by the Sectional Committee in May 1929 and approved by the American Standards Association in July 1930. They were published as B29a-1930, Roller Chain, Sprockets, and Cutters. This roller chain standard ensured interchangeability and optional sources of supply.

In 1930, the Association of Roller and Silent Chain Manufacturers (ARSCM) was founded. The objectives of the association were to cooperate in developing standards of sound engineering and manufacturing practice, to foster improvements in chain performance, and to extend the use of roller chains. This association was subsequently dissolved in 1960, and its members became part of the American Sprocket Chain Manufacturers Association (ASCMA), which was organized to bring together manufacturers of all types of sprocket-driven chains. The name of this group was changed in 1971 to the American Chain Association (ACA).

As a result of combined industry research programs sponsored by ARSCM, starting in 1946 and continuing under ASCMA, greater predictability of roller chain drive service life has been achieved. These studies provided greater knowledge of such roller chain characteristics as link plate endurance strengths, roller impact forces, dynamic tension forces, operating efficiency, wear life of well-lubricated drives at various speeds and loads, pin–bushing interaction at high speeds, and the phenomenon of chain joint galling. This scientific exploration produced such vast gains in the technical knowledge of capabilities of roller chains that increases in horsepower ratings were possible. The wear studies, for example, have shown that a separating film of lubricant is formed in chain joints in a manner similar to that found in journal bearings. These studies thus opened a region of chain application at high speeds that had previously been thought to be impractical. The direct result of this research has been the continual increase in chain horsepower ratings contained in Nonmandatory Appendix A. This Appendix also contains suggestions concerning the application and use of the chains covered by this Standard.

This Standard covers transmission roller chains, attachments, and sprockets. It is intended to facilitate fulfillment of the needs of users, distributors, and manufacturers of chain sprocket drives on a sound economic basis and in a manner consistent with sound engineering and manufacturing practices.

Control dimensions are given in this Standard to ensure interchangeability between chains, sprockets, and chain links as supplied by different manufacturers. Information for the guidance of users in the application of these drives is also included.

In addition to its customary usage as a power transmission medium, precision roller chain has also been adapted for use in conveying, elevating, indexing, and timing operations. Modifications of standard chain parts to perform these functions are known as *attachments.* To ensure interchangeability of the more commonly used attachments, standardization of certain principal dimensions

was initiated in 1947. This information, formerly published as a separate standard, was incorporated into this precision roller chain Standard.

ASME/ANSI B29.1M-1986 was approved by the American National Standards Institute on January 9, 1986.

ASME B29.1M-1993 included two significant modifications. The first was a revision to the definition of minimum ultimate tensile strength that clarified the meaning and use of the term. The second was a revision to the listed values for maximum pin diameter and minimum hole in bushing. These changes did not affect the interchangeability of the chains. The values were changed to provide a rational basis for conversion between conventional (inch) and SI (metric) dimensions. With concurrent changes in the related ISO standards, a long-standing area of potential discrepancies was eliminated. ASME B29.1M-1993 was approved by the American National Standards Institute on August 10, 1993.

ASME B29.1M, Precision Power Transmission Roller Chains, Attachments, and Sprockets; ASME B29.3M, Double-Pitch Power Transmission Roller Chains and Sprockets; and ASME B29.4M, Double-Pitch Conveyor Roller Chains, Attachments, and Sprockets, were incorporated into a new standard that was designated ASME B29.100.

ASME B29.100-2002 included four significant modifications to B29.1: a revision to the minimum ultimate tensile strength definition, the addition of minimum dynamic strength and conformance test requirements for chains specified in this Standard, the addition of requirements for roller chain preloading, and a revision to the note in para. A1.8. The revision recognized the need for the user to contact the roller chain manufacturer for specific derating factors for slip-fit connecting links, offset sections, and offset links. Similar changes were being made to International Standard ISO 606 to be in close agreement with that standard. ASME B29.100-2002 was approved as an American National Standard on April 3, 2002.

In 2008, the B29 Standards Committee agreed to remove the portion of the ASME B29.100 standard formerly known as ASME B29.1 from the incorporated standard, reestablishing ASME B29.1 as a separate standard.

ASME B29.1-2011 includes significant changes to the nonmandatory appendices. Nonmandatory Appendix A was revised to use the new and improved power ratings for American National Standard (ANS) roller chains issued by the ACA in 2001. Nonmandatory Appendix B was added to show the equations on which the new ratings are based. Information on sprocket tooth cutting tools was moved to the new Nonmandatory Appendix C. ASME B29.1-2011 was approved as an American National Standard on July 15, 2011.

Dimensional limits in this Standard are presented in U.S. customary inch–pound units. Companion tabulations are included to show conversions of the final limiting values into metric (SI) units in accordance with ASME Guide SI-1, ASME Orientation and Guide for Use of SI (Metric) Units. Most formulas and relationships are intentionally presented only in customary units to preclude any ambiguity between them and the tabulated values.

In most respects, ASME B29.1-2011 is harmonized with ISO 606. However, the B29 Standards Committee decided to maintain the separate B29.1 standard for the following two reasons:

(a) ISO permits only SI units to be shown in International Standards. The ANS chains and sprockets in this Standard were originally designed in U.S. customary inch–pound units. Conversion to SI units and rounding before making critical calculations introduce deviations that can be detrimental to roller chain functioning.

(b) The ANS tooth form in ASME B29.1 fits within the ISO 606 sprocket tooth form envelope, but the tooth form in ASME B29.1 is described in much more detail. Deviations from the tooth form as defined in this Standard, but within the ISO 606 envelope, can be detrimental to chain performance.

ASME B29 STANDARDS COMMITTEE
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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Proposing Revisions. Revisions are made periodically to the Standard to incorporate changes that appear necessary or desirable, as demonstrated by the experience gained from the application of the Standard. Approved revisions will be published periodically.

The Committee welcomes proposals for revisions to this Standard. Such proposals should be as specific as possible, citing the paragraph number(s), the proposed wording, and a detailed description of the reasons for the proposal, including any pertinent documentation.

Interpretations. Upon request, the B29 Committee will render an interpretation of any requirement of the Standard. Interpretations can only be rendered in response to a written request sent to the Secretary of the B29 Standards Committee.

The request for interpretation should be clear and unambiguous. It is further recommended that the inquirer submit his/her request in the following format:

Subject:	Cite the applicable paragraph number(s) and the topic of the inquiry.
Edition:	Cite the applicable edition of the Standard for which the interpretation is being requested.
Question:	Phrase the question as a request for an interpretation of a specific requirement suitable for general understanding and use, not as a request for an approval of a proprietary design or situation. The inquirer may also include any plans or drawings that are necessary to explain the question; however, they should not contain proprietary names or information.

Requests that are not in this format will be rewritten in this format by the Committee prior to being answered, which may inadvertently change the intent of the original request.

ASME procedures provide for reconsideration of any interpretation when or if additional information that might affect an interpretation is available. Further, persons aggrieved by an interpretation may appeal to the cognizant ASME Committee or Subcommittee. ASME does not "approve," "certify," "rate," or "endorse" any item, construction, proprietary device, or activity.

Attending Committee Meetings. The B29 Standards Committee regularly holds meetings, which are open to the public. Persons wishing to attend any meeting should contact the Secretary of the B29 Standards Committee.

PRECISION POWER TRANSMISSION ROLLER CHAINS, ATTACHMENTS, AND SPROCKETS

CAUTION: The standardized chains listed in this Standard are intended primarily for power transmission and conveying purposes, and should not be used as replacements for chains used on overhead hoists. See ASME B29.24, Roller Load Chains for Overhead Hoists, for information relating to roller chains specifically intended for overhead hoisting duty.

1 ROLLER CHAIN

1.1 Nomenclature

The following definitions are illustrated in Fig. 1.

connecting link (cotter pin type): 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*. The following three types of detachable pin link plates are available:

(a) with a slip fit

(b) with a degree of press fit (drive fit)

(c) with a full press fit (as in conventional chain construction)

connecting link (spring clip type): a connecting link generally as described above, except that the detachable link plate is retained by a one-piece spring clip *K* that engages grooves cut in the ends of the pins.

offset link: a link consisting of two offset link plates *I–I*, a bushing *B*, a roller *C*, a removable pin *J*, and cotter *H*.

offset section: a two-link section consisting of a roller link and an offset link, which are connected by a riveted press-fit pin.

pin link: an outside link consisting of two pin link plates *E–E* assembled with two pins *F–F*.

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 fit in their respective link plates. Roller chain may be *single strand*, having one row of roller links, or *multiple strand*, having more than one row of roller links, and in which center plates *L* are located between the strands of roller links. Center plates may be slip fit or press fit on the pin as agreed between the chain manufacturer and user.

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 $\frac{5}{8}$ × pitch.

(b) The *chain width* is defined as the distance between roller link plates and equals approximately $\frac{5}{8}$ × chain pitch.

(c) The pin diameter is approximately $\frac{5}{16}$ × pitch or one-half of the roller diameter.

(d) The thickness of link plates for the standard series is approximately $\frac{1}{8}$ × pitch.

(e) The thickness of link plates for the heavy series chain of any pitch is approximately that of the next larger pitch standard series chain.

(f) The maximum height of roller link plates is 0.95 × pitch.

(g) The maximum height of pin link plates is 0.82 × pitch.

(h) Although chamfers are shown on the link plates illustrated, chamfering is not a requirement and is done at the option of the manufacturer.

1.3 Numbering System — Standard Chain Numbers

For the chains shown in this Standard, the right-hand digit in the chain designation is zero for roller chains of the usual proportions, 1 for a lightweight chain, and 5 for a rollerless bushing chain. The numbers to the left of the right-hand digit denote the number of $\frac{1}{8}$ in. in the pitch. The letter H following the chain number denotes the heavy series. The hyphenated number 2 suffixed to the chain number denotes a double strand, 3 denotes a triple strand, 4 denotes a quadruple strand chain, etc.

Heavy series chains made in $\frac{3}{4}$ in. (19.05 mm) and larger pitches differ from the standard series in thickness of link plates. Their value is only in the acceptance of higher loads during operation at lower speeds.

1.4 Chain Strength Requirements

1.4.1 Minimum Ultimate Tensile Strength

(a) Single-Strand Chain. Standard series single-strand chains meeting the requirements of this Standard will have a minimum ultimate tensile strength equal to or greater than the values listed in Table 1 or Table 1M.

(b) Multiple-Strand Chain. For a multiple-strand chain, the minimum ultimate tensile strength equals that of a single strand multiplied by the number of strands.

(c) Lightweight Chain. A lightweight chain designated as no. 41 does not conform to the general chain proportions. The minimum ultimate tensile strength is 1,500 lb (6.67 kN).

(d) Minimum Ultimate Tensile Strength (M.U.T.S) for a 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.

WARNING: The minimum ultimate tensile strength is NOT a "working load." The M.U.T.S. greatly exceeds the maximum force that may be applied to the chain.

(1) Test Procedure. A tensile force is slowly applied at a rate not to exceed 2.0 in./min (50.8 mm/min), in a uniaxial direction, to the ends of the chain sample.

(2) 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.

1.4.2 Minimum Dynamic Strength

(a) Application. Only single-strand standard and heavy series chains are subject to the minimum dynamic strength requirement. Multiple-strand chains, attachment chains, connecting links, and offset links are not subject to the minimum dynamic strength requirement.

(b) Conformance. The chain shall survive a conformance test at the load listed for the subject chain in Table 1 or Table 1M.

WARNING: The dynamic test values are not valid characteristics for designing actual applications. Neither the specified value nor the test results are to be interpreted as allowable working loads.

(c) Test Procedure. The chain shall be tested according to the conformance test described in ASME B29.26-2001.

WARNING: The dynamic test is a destructive test. Even though the chain may survive the test without failure, it will have been damaged and will be unfit for service.

1.4.3 Chain Preloading. Chains conforming to this Standard shall be preloaded during manufacturing by applying a tensile force equal to a minimum of 30% of the M.U.T.S. given in Table l or Table 1M.

1.5 Tolerance for Chain Length

New chains, under standard measuring load, shall not be underlength.

Overlength tolerance is $0.001/(\text{pitch in inches})^2 + 0.015$ in./ft. See para. 2.3 for tolerance of chain with attachments.

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 18 lb (80 N) and a maximum of 1,000 lb (4.45 kN), for both single- and multiple-strand chains. Length measurements are to be taken over a length of at least 12 in. (300 mm).

1.7 General Chain Dimensions

See Tables 1 and 1M.

1.8 Maximum Chain Dimensions

See Tables 2 and 2M.

1.9 Dimensional Limits for Interchangeability of Links

See Tables 3 and 3M. To ensure interchangeability of links produced by different makers of chains, the following standard maximum and minimum limits are adopted:

(a) Minimum distance between roller link plates is the nominal width of the chain minus the quantity (0.002 + 0.003 × pitch).

(b) Maximum pin diameter: see Tables 3 and 3M.

(c) Minimum hole in bushing: see Tables 3 and 3M.

(d) Maximum width of roller link = nominal width of chain + (2.12 × nominal link plate thickness).

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

(f) Nominal transverse pitch of multiple-strand chain = nominal width of chain + (4.22 × nominal link plate thickness).

(g) Standard offset links are made to accommodate chains having roller link plates with a maximum height equal to 0.95 × pitch, and pin link plates with a maximum height equal to 0.82 × pitch. Therefore, the standard minimum values of X and Y are shown in Fig. 2.

(h) A lightweight chain designated as no. 41 does not conform to the general chain proportions. Roller link plates have a maximum height of 0.390 in. (9.91 mm), and pin link plates have a maximum height of 0.335 in. (8.51 mm).

2 ATTACHMENTS

2.1 Nomenclature

Attachments are modifications to standard chain components to adapt the chains for use in conveying, elevating, and timing operations. The components commonly modified are the link plates, which are provided with extended lugs, and the chain pins, which are extended in length so as to project substantially beyond the outer surface of the pin link plates (see Fig. 3).

2.2 General Proportions

Standardized attachments are available for transmission roller chain, $\frac{3}{8}$ in. (9.52 mm) through 2 in. (50.8 mm) pitch inclusive, and $2\frac{1}{2}$ in. (63.5 mm) pitch. The standardized dimensions conform approximately to the following formulas. It is recommended that these formulas be applied when extending these standards to additional sizes of chain.

(a) Distance from centerline of hole in straight link plate extension to pitch line:

$$D = 1 \times \text{chain pitch}$$

(b) Distance from centerline of hole in bent link plate extension to chain centerline:

$$D = 1 \times \text{chain pitch}$$

(c) Distance from top of bent link plate extension to pitch line:

$$C = 0.625 \times \text{chain pitch}$$

(d) Angle of bend of link plate extension equals 90 deg.

(e) Diameter of pin extension:

$$D_p = \text{nominal diameter of chain pin}$$

(f) Length of pin extension:

$$L = 0.750 \times \text{chain pitch}$$

2.3 Tolerance for Chain Length

New chains with attachments, under standard measuring load, shall not be underlength.

Overlength tolerance equals 0.002/(pitch in inches)^2 + 0.030 in./ft. Length tolerance shall conform to the tabulation below:

Standard Chain No.	Length Tolerance	
	in./ft	mm/m
35	0.044	3.67
40	0.038	3.17
50	0.035	2.92
60	0.034	2.83
80	0.032	2.67
100	0.031	2.58
120	0.031	2.58
140	0.031	2.58
160	0.031	2.58
200	0.030	2.50

2.4 Straight Link Plate Extension Dimensions

See Tables 4 and 4M.

2.5 Bent Link Plate Extension Dimensions

See Tables 5 and 5M.

2.6 Extended Pin Dimensions

See Table 6.

3 SPROCKETS

3.1 Types of Sprockets

The four principal types of sprockets are designated in Fig. 4.

3.2 Classes of Sprockets

This Standard provides for two classes of sprockets, commercial and precision. Use of commercial or precision sprockets is a matter of drive application judgment. The usual moderate-to-slow speed commercial drive is adequately served by commercial sprockets. Where extreme high speed in combination with high load is involved, or where the drive involves fixed centers, critical timing or register problems, or close clearance with outside interference, then the use of precision sprockets may be more appropriate.

As a general guide, drives requiring Type A or Type B lubrication would be served by commercial sprockets. Drives requiring Type C lubrication may require precision sprockets, although even here commercial may be satisfactory. Consult the manufacturer. Types of lubrication are shown in the horsepower ratings tables (Tables A-4 through A-26) provided in Nonmandatory Appendix A.

3.3 Tooth Section Profile

The tooth section profile, Sections A and B of Tables 7 and 7M, shows the recommended chamfering of sprocket teeth 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 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.

3.4 Sprocket Flange Location and Thickness

See Fig. 5 and Tables 8, 8M, 9, 9M, 10, and 10M.

3.5 Tooth Form Dimensions

The tooth form shown in Fig. 6 is a theoretical form for the specific number of teeth, N, and is designed so that the chain, as it wears and elongates, will ride out toward the tips of the teeth. Because of the variety of ways to produce sprocket teeth, the actual teeth may not exactly match the theoretical form. In the case of space cutters or milling cutters, it is common practice to design cutters to cut a form for an intermediate number of teeth for one of five ranges. This results in the cutter, the sprocket, and the theoretical form matching only at 56 teeth. In the case of hobs or shapers, the generated sprocket tooth form comes very close to the theoretical form for all numbers of teeth, but actually matches only where and if the cutting tool design is based on a specific whole number of teeth. Cast, powder metal, or plastic molded teeth may or may not match the theoretical form, depending on how their pattern, die, or mold was designed and formed. All of these forms have proved to be acceptable in service. The

important thing is that the seating curve diameter, bottom diameter, flange width, and chordal pitch be such as to accept the meshing chain without wedging or binding, so as to minimize chain loading and impact. (For additional information on cutting tools, see Nonmandatory Appendix C.)

3.6 Seating Curve Dimensions and Tolerances

See Tables 11 and 11M.

3.7 Sprocket Diameters, Measuring Dimensions, and Tolerances

See Fig. 7 and Tables 12, 12M, 13, and 13M.

3.8 Pitch Diameter, Outside Diameter, and Measuring Dimension Factor for Chain of Unity Pitch

See Tables 14, 15, and 15M. For chain pitches other than those shown in Table 14, use the following formulas:

(a) Pitch diameter equals pitch diameter from Table 14 × chain pitch.

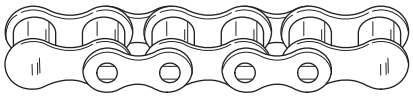
(b) Outside diameter equals outside diameter from Table 14 × chain pitch.

(c) Caliper diameter factor equals $PD \cos (90 \text{ deg}/N)$.

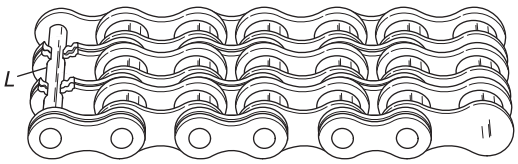
(d) Caliper diameter (odd teeth) equals (caliper diameter factor from Table 14 × chain pitch) minus roller diameter.

(e) Caliper diameter (even teeth) equals pitch diameter minus roller diameter.

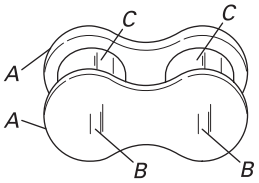
Fig. 1 Precision Power Transmission Roller Chain and Components



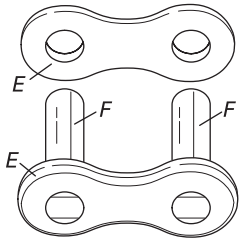
(a) Roller Chain (Single Strand)



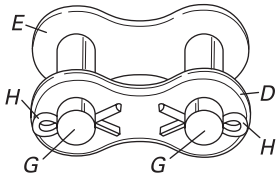
(b) Roller Chain (Multiple Strand)



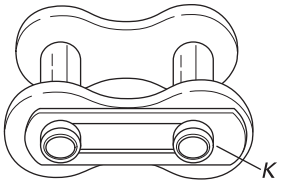
(c) Roller Link



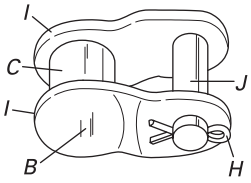
(d) Pin Link



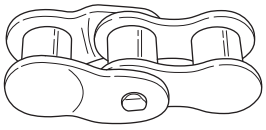
(e) Connecting Link (Cotter Pin Type)



(f) Connecting Link (Spring Clip Type)

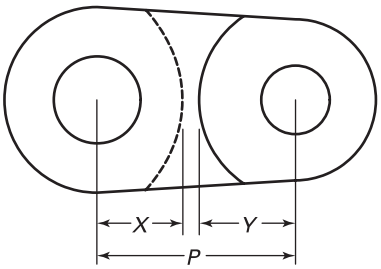


(g) Offset Link



(h) Offset Section

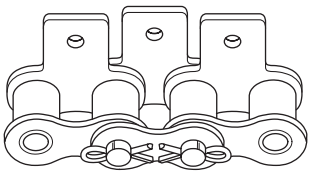
Fig. 2 Offset Link Plate



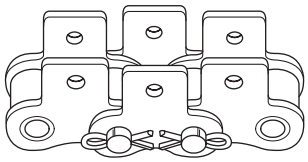
P = chain pitch
X minimum = $0.41P$ + clearance
Y minimum = $0.475P$ + clearance
clearance = $0.001 + 0.004P$

GENERAL NOTE: Clearance shall never be less than 0.002 in. (0.05 mm) nor more than 0.008 in. (0.20 mm), regardless of formula.

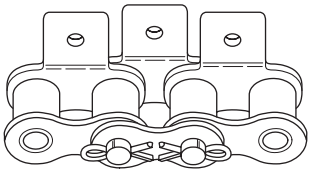
Fig. 3 Attachments



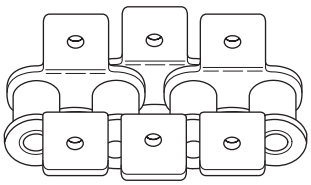
(a) Straight Link Plate Extensions on One Side of Chain



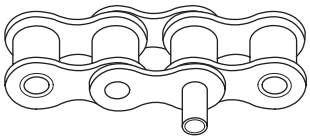
(b) Straight Link Plate Extensions on Both Sides of Chain



(c) Bent Link Plate Extensions on One Side of Chain

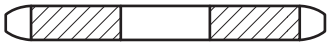


(d) Bent Link Plate Extensions on Both Sides of Chain

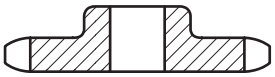


(e) Extended Pin on One Side of Chain

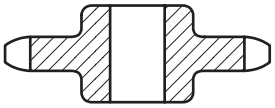
Fig. 4 Types of Sprockets



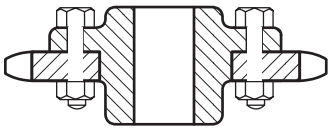
(a) Type A — Plain Plate



(b) Type B — Hub on One Side Only

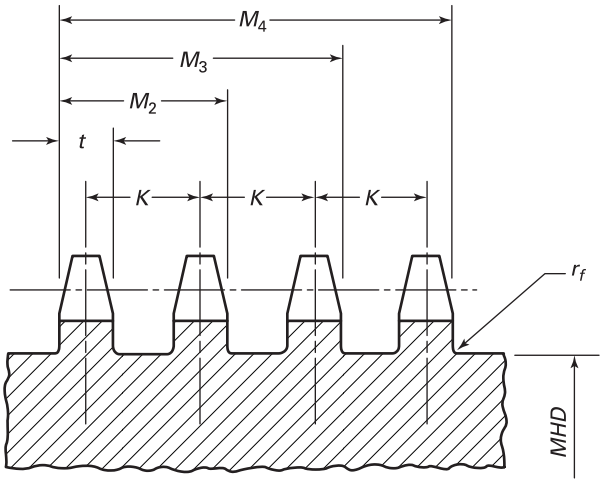


(c) Type C — Hub on Both Sides



(d) Type D — Hub Detachable

Fig. 5 Sprocket Flange Location and Thickness



K = transverse pitch for multiple strand chain
= $W + 4.22(LPT)$
LPT = nominal thickness of link plates
M_2, M_3, M_4, etc. = K(strand multiple − 1) + t
MHD = maximum hub and groove diameter
P = chain pitch [see Table 1 (in.) or 1M (mm)]
r_f max. = fillet radius = $0.04P$ for maximum hub diameter
t_1 = maximum thickness for single strand chain, in.
= $0.93W - 0.006$
t_2 = maximum thickness for double and triple strand chain, in.
= $0.90W - 0.006$
t_4 = maximum thickness for quadruple strand chain and over, in.
= $0.86W - 0.012$
W = nominal chain width (see Table 1 or 1M)

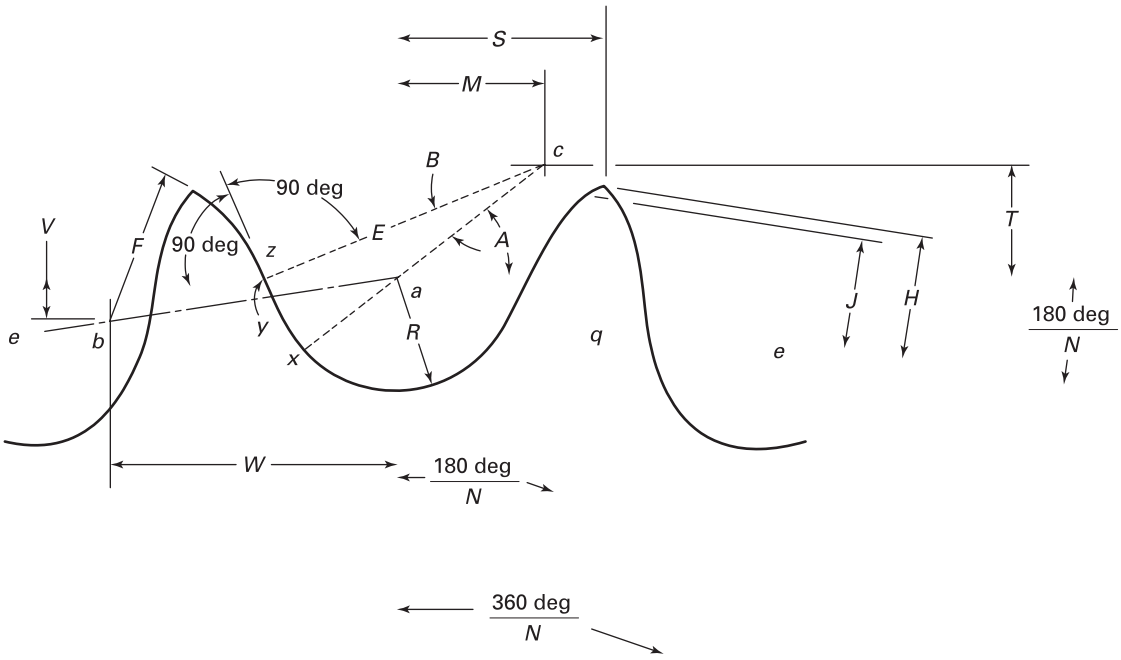
Tolerance on t and M_2, M_3, M_4, etc.

Commercial sprockets
M = plus or minus $(0.01W + 0.006)$, in.
t = plus zero, minus AISI weight tolerance for hot rolled plate converted to linear measure. See Table 10 (in.) or 10M (mm).

Precision sprockets
t, M = plus zero, minus $(0.01W + 0.006)$, in.

Maximum variation in thickness of any individual flange
Commercial = total tolerance
Precision = one-half total tolerance

Fig. 6 Theoretical Tooth Form



$\frac{m}{}$

Fig. 6 Theoretical Tooth Form (Cont'd)

D_r = roller diameter
D_s = seating curve diameter
= $1.005D_r + 0.003$, in.
Ht = circular addendum
= $J - (ma - mq)$

$$= P\left(0.3 - \frac{\tan \frac{90 \text{ deg}}{N_a}}{2}\right)$$

N = number of teeth
N_a = intermediate number of teeth for topping hob range
P = chain pitch (ae)
WD = whole depth of topping hob cut

$$= \frac{D_r}{2} + Ht = \frac{D_r}{2} + P\left(0.3 - \frac{\tan \frac{90 \text{ deg}}{N_a}}{2}\right)$$

GENERAL NOTES:

(a) Angles are calculated as follows:

$$A = 35 \text{ deg} + \frac{60 \text{ deg}}{N}$$

$$B = 18 \text{ deg} - \frac{56 \text{ deg}}{N}$$

The pressure angle for a new chain is $Xab = 35 \text{ deg} - \frac{120 \text{ deg}}{N}$

The minimum pressure angle is $Xab - B = 17 \text{ deg} - \frac{64 \text{ deg}}{N}$

The average pressure angle $= 26 \text{ deg} - \frac{92 \text{ deg}}{N}$

(b) Dimensions are calculated as follows:

$ab = 1.4D_r$
$ac = 0.8D_r$
$E = 1.3025D_r + 0.0015$, in.

$$F = D_r\left[0.8 \cos\left(18 \text{ deg} - \frac{56 \text{ deg}}{N}\right) + 1.4 \cos\left(17 \text{ deg} - \frac{64 \text{ deg}}{N}\right) - 1.3025\right] - 0.0015, \text{ in.}$$

$$H = \sqrt{F^2 - \left(1.4D_r - \frac{P}{2}\right)^2}$$

$$M = 0.8D_r \cos\left(35 \text{ deg} + \frac{60 \text{ deg}}{N}\right)$$

$$R = \frac{D_s}{2} = 0.5025D_r + 0.0015, \text{ in.}$$

$$S = \frac{P}{2} \cos \frac{180 \text{ deg}}{N} + H \sin \frac{180 \text{ deg}}{N}$$

$$T = 0.8D_r \sin\left(35 \text{ deg} + \frac{60 \text{ deg}}{N}\right)$$

$$V = 1.4D_r \sin \frac{180 \text{ deg}}{N}$$

$$W = 1.4D_r \cos \frac{180 \text{ deg}}{N}$$

Chordal length of arc $xy = (2.605D_r + 0.003) \sin\left(9 \text{ deg} - \frac{28 \text{ deg}}{N}\right)$, in.

Fig. 6 Theoretical Tooth Form (Cont'd)

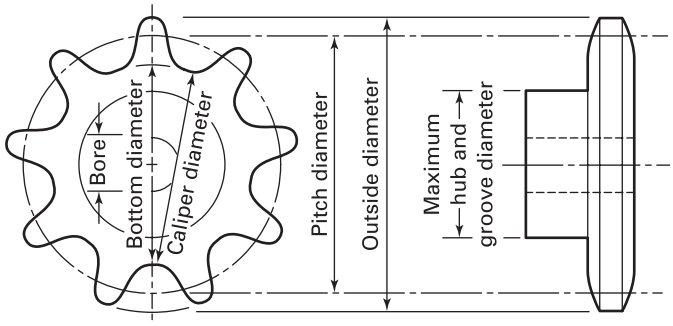
GENERAL NOTES (Cont'd):

Chord $yz = D_r \left[1.4 \sin \left(17 \text{ deg} - \frac{64 \text{ deg}}{N} \right) - 0.8 \sin \left(18 \text{ deg} - \frac{56 \text{ deg}}{N} \right) \right]$

Approximate outside diameter of sprocket when J is $0.3P = P \left(0.6 + \cot \frac{180 \text{ deg}}{N} \right)$

Outside diameter of sprocket when tooth is pointed $= P \cot \frac{180 \text{ deg}}{N} + \cos \frac{180 \text{ deg}}{N} (D_s - D_r) + 2H$

Fig. 7 Sprocket Diameters



D_r = roller diameter
N = number of teeth
P = chain pitch
PD = pitch diameter

GENERAL NOTES:

(a) Pitch diameter of sprocket $= \dfrac{P}{\sin \dfrac{180 \text{ deg}}{N}}$

(b) Bottom diameter of sprocket $= PD - D_r$

(c) Caliper diameter for even number of teeth = bottom diameter

Caliper diameter for odd number of teeth $= PD\left(\cos \dfrac{90 \text{ deg}}{N}\right) - D_r$

Tolerances on caliper diameter of sprockets:

Plus tolerance = 0.000

Commercial minus tolerance $= 0.002P\sqrt{N} + 0.006$, in.

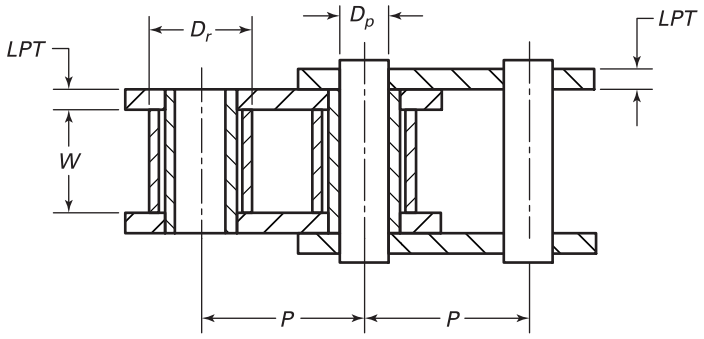
Precision minus tolerance $= 0.001P\sqrt{N} + 0.003$, in.

(d) Approximate outside diameter of turned sprocket $= P\left(0.6 + \cot \dfrac{180 \text{ deg}}{N}\right)$

(e) Outside diameter of topping hob cut sprocket $= PD - D_r + 2WD$

(f) Maximum hub and groove diameter (MHD) of sprockets $= P\left(\cot \dfrac{180 \text{ deg}}{N} - 1\right) - 0.030$, in.

Table 1 General Chain Dimensions, in. and lb

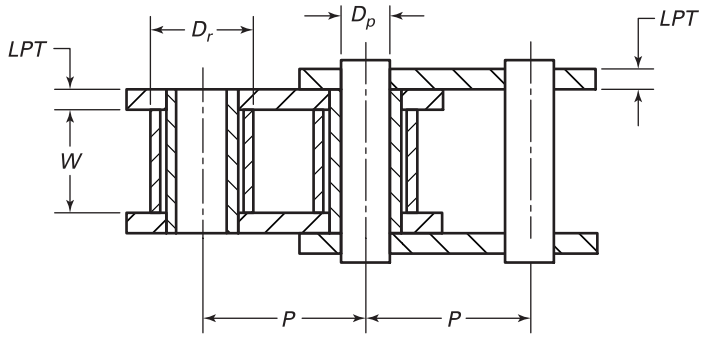


D_p = pin diameter
D_r = maximum roller diameter
LPT = link plate thickness
P = chain pitch
W = nominal chain width

Standard Chain No.	Chain Pitch, P	Maximum Roller Diameter, D_r	Nominal Chain Width, W [Note (1)]	Nominal Pin Diameter, D_p	Link Plate Thickness, LPT		Length Tolerance, in./ft	Measuring Load, lb [Note (2)]	M.U.T.S., Standard and Heavy Series, lb [Note (3)]	Minimum Dynamic Strength, Standard Series, lb	Minimum Dynamic Strength, Heavy Series, lb
					Standard Series	Heavy Series					
25	0.250	0.130 [Note (4)]	0.125	0.0905	0.030	. . .	0.031	18	780	140	. . .
35	0.375	0.200 [Note (4)]	0.188	0.141	0.050	. . .	0.022	18	1,760	320	. . .
41	0.500	0.306	0.250	0.141	0.050	. . .	0.019	18	1,500	305	. . .
40	0.500	0.312	0.312	0.156	0.060	. . .	0.019	31	3,125	560	. . .
50	0.625	0.400	0.375	0.200	0.080	. . .	0.018	49	4,880	870	. . .
60	0.750	0.469	0.500	0.234	0.094	0.125	0.017	70	7,030	1,230	1,420
80	1.000	0.625	0.625	0.312	0.125	0.156	0.016	125	12,500	2,150	2,400
100	1.250	0.750	0.750	0.375	0.156	0.187	0.016	195	19,530	3,280	3,590
120	1.500	0.875	1.000	0.437	0.187	0.219	0.015	281	28,125	4,620	5,000
140	1.750	1.000	1.000	0.500	0.219	0.250	0.015	383	38,280	6,140	6,560
160	2.000	1.125	1.250	0.562	0.250	0.281	0.015	500	50,000	7,820	8,290
180	2.250	1.406	1.406	0.687	0.281	0.312	0.015	633	63,280	9,650	10,200
200	2.500	1.562	1.500	0.781	0.312	0.375	0.015	781	78,125	11,600	12,700
240	3.000	1.875	1.875	0.937	0.375	0.500	0.015	1,000	112,500	15,800	18,300

NOTES:
(1) See Table 3 for decimal minimum dimensions.
(2) For single strand chain.
(3) See Caution on p. 1.
(4) Bushing diameter, as these chains have no rollers.

Table 1M General Chain Dimensions, mm and N

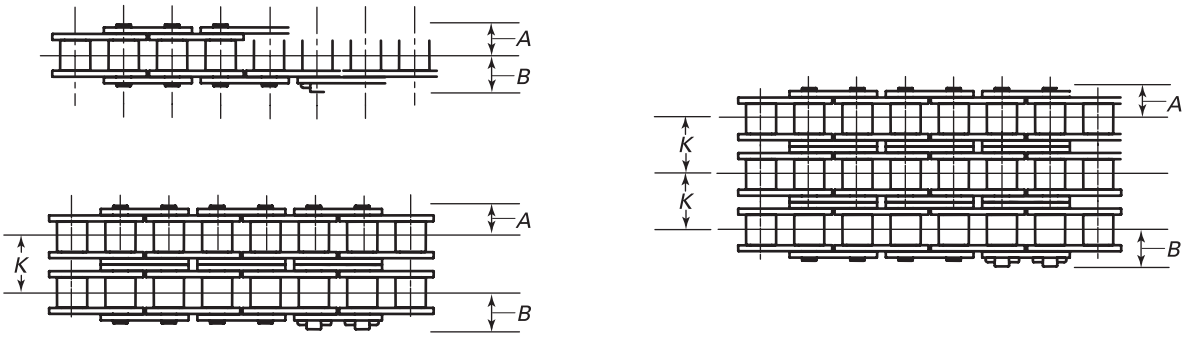


D_p = pin diameter
D_r = maximum roller diameter
LPT = link plate thickness
P = chain pitch
W = nominal chain width

Standard Chain No.	Chain Pitch, P	Maximum Roller Diameter, D_r	Nominal Chain Width, W [Note (1)]	Nominal Pin Diameter, D_p	Link Plate Thickness, LPT		Length Tolerance, mm/m	Measuring Load, N [Note (2)]	M.U.T.S., Standard and Heavy Series, N [Note (3)]	Minimum Dynamic Strength, Standard Series, N	Minimum Dynamic Strength, Heavy Series, N
					Standard Series	Heavy Series					
25	6.35	3.30 [Note (4)]	3.18	2.30	0.76	. . .	2.583	80	3 470	630	. . .
35	9.525	5.08 [Note (4)]	4.78	3.58	1.27	. . .	1.833	80	7 830	1 410	. . .
41	12.70	7.77	6.35	3.58	1.27	. . .	1.583	80	6 670	1 340	. . .
40	12.70	7.92	7.92	3.96	1.52	. . .	1.583	138	13 900	2 480	. . .
50	15.88	10.16	9.53	5.08	2.03	. . .	1.500	218	21 710	3 850	. . .
60	19.05	11.91	12.70	5.94	2.39	3.18	1.417	311	31 270	5 490	6 330
80	25.40	15.88	15.88	7.92	3.18	3.96	1.333	556	55 600	9 550	10 700
100	31.75	19.05	19.05	9.53	3.96	4.75	1.333	867	86 870	14 600	16 000
120	38.10	22.23	25.40	11.10	4.75	5.56	1.250	1 250	125 100	20 500	22 200
140	44.45	25.40	25.40	12.70	5.56	6.35	1.250	1 704	170 270	27 300	29 200
160	50.80	28.58	31.75	14.27	6.35	7.14	1.250	2 224	222 400	34 800	36 900
180	57.15	35.71	35.71	17.45	7.14	7.92	1.250	2 816	281 470	42 900	45 200
200	63.50	39.68	38.10	19.84	7.92	9.53	1.250	3 474	347 500	51 600	56 600
240	76.20	47.63	47.63	23.80	9.53	12.70	1.250	4 448	500 400	70 500	81 400

NOTES:
(1) See Table 3M for decimal minimum dimensions.
(2) For single strand chain.
(3) See Caution on p. 1.
(4) Bushing diameter, as these chains have no rollers.

Table 2 Maximum Width Over Regular Pin, in.

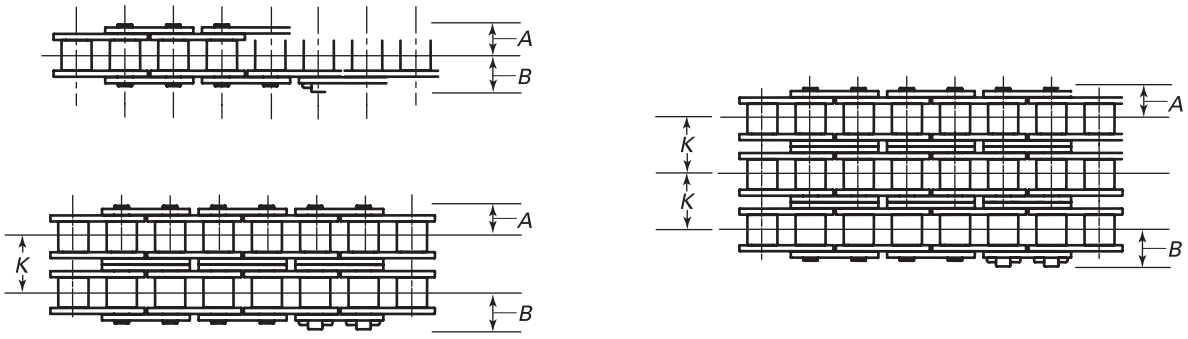


A = maximum half-width of outboard chain strand with regular pin
B = maximum half-width of outboard chain strand with connecting pin
K = transverse pitch (from Table 7)
N = number of strands

Standard Chain Number	$(N-1)K + 2A$ for Number of Chain Strands						Add for Connecting Pin Head
	1	2	3	4	6	8	
25	0.36	0.61	0.86	1.11	1.62	2.12	0.10
35	0.52	0.92	1.32	1.72	2.51	3.31	0.12
41	0.59	. . .	. . .	. . .	. . .	. . .	0.13
40	0.70	1.27	1.83	2.40	3.53	4.66	0.13
50	0.86	1.57	2.29	3.00	4.42	5.85	0.15
60	1.06	1.95	2.85	3.75	5.54	7.34	0.17
80	1.34	2.49	3.65	4.80	7.10	9.41	0.20
100	1.62	3.03	4.44	5.84	8.66	11.48	0.23
120	2.03	3.82	5.61	7.40	10.97	14.55	0.27
140	2.19	4.11	6.04	7.96	11.81	15.66	0.30
160	2.60	4.90	7.21	9.51	14.12	18.73	0.34
180	2.91	5.50	8.09	10.69	15.87	21.05	0.37
200	3.16	5.98	8.80	11.61	17.25	22.88	0.40
240	3.86	7.31	10.77	14.23	21.15	28.06	0.47
60H	1.19	2.22	3.24	4.27	6.33	8.38	0.17
80H	1.47	2.75	4.04	5.32	7.88	10.45	0.20
100H	1.75	3.29	4.83	6.37	9.45	12.52	0.23
120H	2.16	4.09	6.01	7.94	11.78	15.63	0.27
140H	2.32	4.38	6.43	8.49	12.60	16.71	0.30
160H	2.73	5.17	7.60	10.04	14.91	19.79	0.34
180H	3.04	5.76	8.49	11.21	16.66	22.10	0.37
200H	3.43	6.51	9.59	12.68	18.84	25.01	0.40
240H	4.38	8.37	12.35	16.34	24.31	32.28	0.47

GENERAL NOTE: Maximum diameter of chain on sprockets = sprocket pitch diameter + (0.95 × chain pitch).

Table 2M Maximum Width Over Regular Pin, mm



A = maximum half-width of outboard chain strand with regular pin
B = maximum half-width of outboard chain strand with connecting pin
K = transverse pitch (from Table 7M)
N = number of strands

Standard Chain Number	$(N-1)K + 2A$ for Number of Chain Strands						Add for Connecting Pin Head
	1	2	3	4	6	8	
25	9.1	15.5	21.9	28.3	41.1	53.9	2.5
35	13.2	23.3	33.4	43.6	63.8	84.1	2.9
41	15.0	. . .	. . .	. . .	. . .	. . .	3.4
40	17.8	32.1	46.5	60.9	89.6	118.4	3.4
50	21.8	39.9	58.0	76.2	112.4	148.6	3.8
60	26.8	49.6	72.4	95.2	140.8	186.3	4.2
80	34.0	63.3	92.6	121.9	180.4	239.0	5.1
100	41.2	76.9	112.7	148.5	220.0	291.5	5.9
120	51.5	97.0	142.4	187.8	278.7	369.6	6.8
140	55.6	104.5	153.4	202.2	300.0	397.7	7.7
160	66.0	124.5	183.1	241.6	358.7	475.8	8.5
180	73.9	139.8	205.6	271.4	403.1	534.8	9.4
200	80.3	151.9	223.4	295.0	438.1	581.2	10.2
240	97.9	185.8	273.6	361.4	537.1	712.8	11.9
60H	30.2	56.3	82.4	108.5	160.7	212.9	4.2
80H	37.3	69.9	102.5	135.1	200.3	265.4	5.1
100H	44.5	83.6	122.7	161.8	239.9	318.1	5.9
120H	54.9	103.8	152.7	201.5	299.3	397.0	6.8
140H	58.9	111.1	163.3	215.5	319.9	424.3	7.7
160H	69.3	131.2	193.1	255.0	378.8	502.6	8.5
180H	77.3	146.4	215.6	284.7	423.1	561.4	9.4
200H	87.1	165.4	243.7	322.0	478.6	635.2	10.2
240H	111.3	212.5	313.8	415.0	617.4	819.9	11.9

GENERAL NOTE: Maximum diameter of chain on sprockets = sprocket pitch diameter + (0.95 × chain pitch).

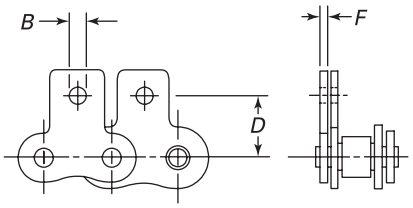
Table 3 Dimensional Limits for Interchangeable Chain Links, in.

Standard Chain No.	25	35	41	40	50	60	80	100	120	140	160	180	200	240
Chain Pitch	0.250	0.375	0.500	0.500	0.625	0.750	1.000	1.250	1.500	1.750	2.000	2.250	2.500	3.000
Minimum distance between roller link plates	0.122	0.184	0.246	0.309	0.370	0.495	0.620	0.744	0.993	0.993	1.242	1.397	1.490	1.864
Maximum width of roller link, standard series	0.189	0.294	0.357	0.440	0.545	0.699	0.890	1.081	1.396	1.464	1.780	2.002	2.161	2.670
Maximum width of roller link, heavy series	. . .	. . .	. . .	. . .	. . .	0.765	0.956	1.146	1.464	1.530	1.846	2.067	2.295	2.935
Minimum distance between pin link plates, standard series	0.191	0.296	0.359	0.442	0.547	0.701	0.892	1.083	1.398	1.466	1.782	2.004	2.163	2.672
Minimum distance between pin link plates, heavy series	. . .	. . .	. . .	. . .	. . .	0.767	0.958	1.148	1.466	1.532	1.848	2.069	2.297	2.937
Maximum pin diameter	0.0909	0.1417	0.1417	0.1567	0.2004	0.2346	0.3126	0.3756	0.4374	0.5004	0.5626	0.6874	0.7815	0.9374
Minimum hole in bushing	0.0921	0.1425	0.1425	0.1575	0.2016	0.2354	0.3134	0.3764	0.4386	0.5016	0.5634	0.6886	0.7823	0.9386
Minimum value of *X* for offset link plates (see Fig. 2)	0.104	0.156	0.171	0.208	0.260	0.311	0.415	0.518	0.622	0.725	0.828	0.931	1.033	1.238
Minimum value of *Y* for offset link plates (see Fig. 2)	0.121	0.181	0.198	0.240	0.300	0.360	0.480	0.600	0.719	0.839	0.958	1.077	1.195	1.433

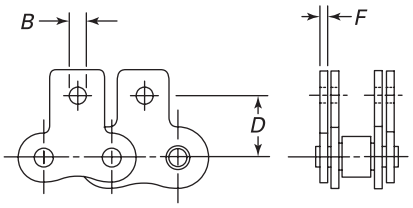
Table 3M Dimensional Limits for Interchangeable Chain Links, mm

Standard Chain No.	25	35	41	40	50	60	80	100	120	140	160	180	200	240
Chain Pitch	**6.35**	**9.52**	**12.70**	**12.70**	**15.88**	**19.05**	**25.40**	**31.75**	**38.10**	**44.45**	**50.80**	**57.15**	**63.50**	**76.20**
Minimum distance between roller link plates	3.10	4.68	6.25	7.85	9.40	12.58	15.75	18.90	25.23	25.23	31.55	35.49	37.85	47.35
Maximum width of roller link, standard series	4.80	7.46	9.06	11.17	13.84	17.75	22.60	27.45	35.45	37.18	45.21	50.85	54.88	67.81
Maximum width of roller link, heavy series	...	...	...	...	...	19.43	24.28	29.10	37.18	38.86	46.88	52.50	58.29	74.54
Minimum distance between pin link plates, standard series	4.85	7.52	9.12	11.23	13.89	17.81	22.66	27.51	35.51	37.24	45.26	50.90	54.94	67.87
Minimum distance between pin link plates, heavy series	...	...	...	...	...	19.48	24.33	29.16	37.24	38.91	46.94	52.55	58.34	74.60
Maximum pin diameter	2.31	3.60	3.60	3.98	5.09	5.96	7.94	9.54	11.11	12.71	14.29	17.46	19.85	23.81
Minimum hole in bushing	2.34	3.62	3.62	4.00	5.12	5.98	7.96	9.56	11.14	12.74	14.31	17.49	19.87	23.84
Minimum value of *X* for offset link plates (see Fig. 2)	2.65	3.97	4.35	5.29	6.61	7.90	10.55	13.16	15.80	18.42	21.04	23.65	26.24	31.45
Minimum value of *Y* for offset link plates (see Fig. 2)	3.08	4.60	5.03	6.10	7.62	9.15	12.20	15.24	18.27	21.32	24.34	27.36	30.36	36.40

Table 4 Straight Link Plate Extension Dimensions, in.



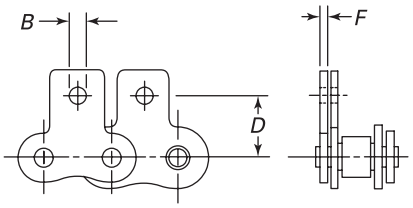
(a) Straight Link Plate Extensions on One Side of Chain



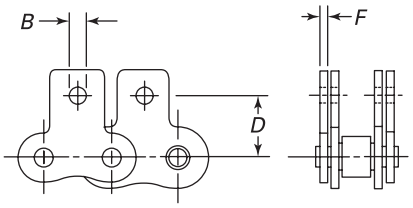
(b) Straight Link Plate Extensions on Both Sides of Chain

Standard Chain No.	*B*, min.	*D*	*F*
35	0.102	0.375	0.050
40	0.131	0.500	0.060
50	0.200	0.625	0.080
60	0.200	0.719	0.094
80	0.261	0.969	0.125
100	0.323	1.250	0.156
120	0.386	1.438	0.188
140	0.448	1.750	0.219
160	0.516	2.000	0.250
200	0.641	2.500	0.312

Table 4M Straight Link Plate Extension Dimensions, mm



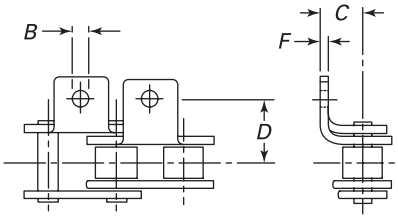
(a) Straight Link Plate Extensions on One Side of Chain



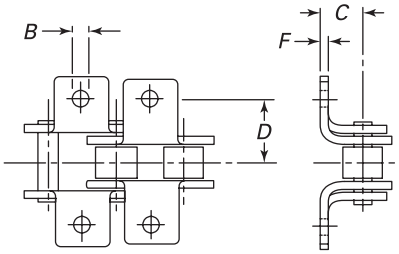
(b) Straight Link Plate Extensions on Both Sides of Chain

Standard Chain No.	*B*, min.	*D*	*F*
35	2.60	9.52	1.27
40	3.33	12.70	1.52
50	5.08	15.88	2.03
60	5.08	18.26	2.39
80	6.63	24.61	3.18
100	8.21	31.75	3.96
120	9.81	36.53	4.78
140	11.38	44.45	5.56
160	13.11	50.80	6.35
200	16.29	63.50	7.92

Table 5 Bent Link Plate Extension Dimensions, in.



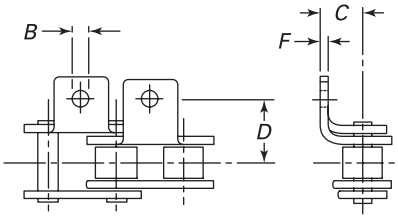
(a) Bent Link Plate Extensions on One Side of Chain



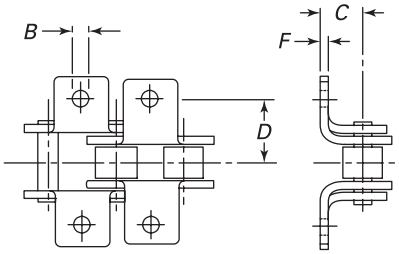
(b) Bent Link Plate Extensions on Both Sides of Chain

Standard Chain No.	*B*, min.	*C*	*D*	*F*
35	0.102	0.250	0.375	0.050
40	0.131	0.312	0.500	0.060
50	0.200	0.406	0.625	0.080
60	0.200	0.469	0.750	0.094
80	0.261	0.625	1.000	0.125
100	0.323	0.781	1.250	0.156
120	0.386	0.906	1.500	0.188
140	0.448	1.125	1.750	0.219
160	0.516	1.250	2.000	0.250
200	0.641	1.688	2.500	0.312

Table 5M Bent Link Plate Extension Dimensions, mm



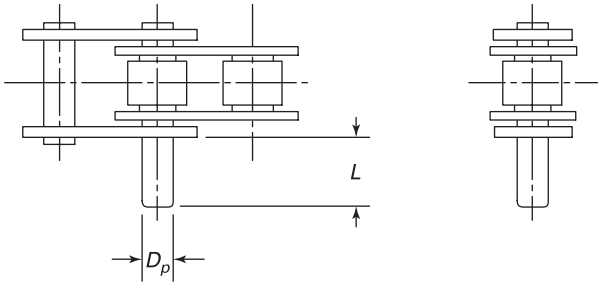
(a) Bent Link Plate Extensions on One Side of Chain



(b) Bent Link Plate Extensions on Both Sides of Chain

Standard Chain No.	*B*, min.	*C*	*D*	*F*
35	2.60	6.35	9.52	1.27
40	3.33	7.92	12.70	1.52
50	5.08	10.31	15.88	2.03
60	5.08	11.91	19.05	2.39
80	6.63	15.88	25.40	3.18
100	8.21	19.84	31.75	3.96
120	9.81	23.01	38.10	4.78
140	11.38	28.58	44.45	5.56
160	13.11	31.75	50.80	6.35
200	16.29	42.88	63.50	7.92

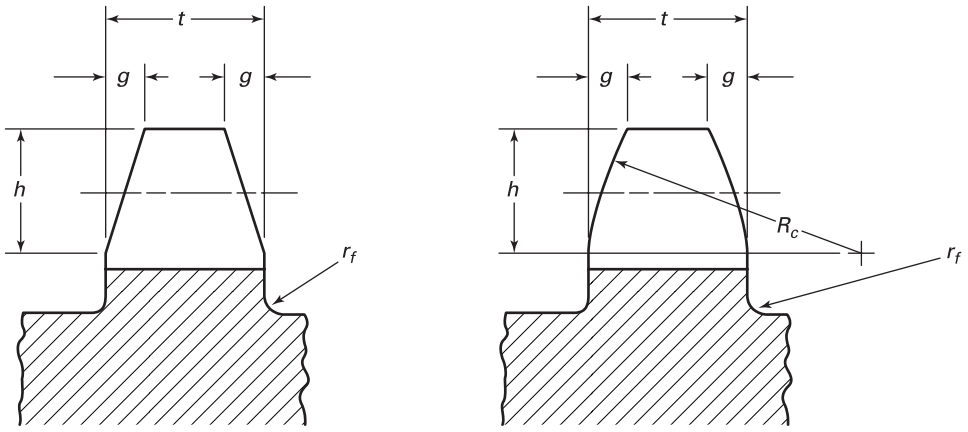
Table 6 Extended Pin Dimensions



Extended Pin on One Side of Chain

Standard Chain No.	Customary Units: Nominal Pin Diameter, D_p, in.	Customary Units: L, in.	Metric Units: Nominal Pin Diameter, D_p, mm	Metric Units: L, mm
35	0.141	0.375	3.58	9.52
40	0.156	0.375	3.96	9.52
50	0.200	0.469	5.08	11.91
60	0.234	0.562	5.94	14.27
80	0.312	0.750	7.92	19.05
100	0.375	0.938	9.52	23.83
120	0.437	1.125	11.10	28.58
140	0.500	1.312	12.70	33.32
160	0.562	1.500	14.27	38.10
200	0.781	1.875	19.84	47.62

Table 7 Sprocket Tooth Section Profile Dimensions of Commercial and Precision Sprockets, in.



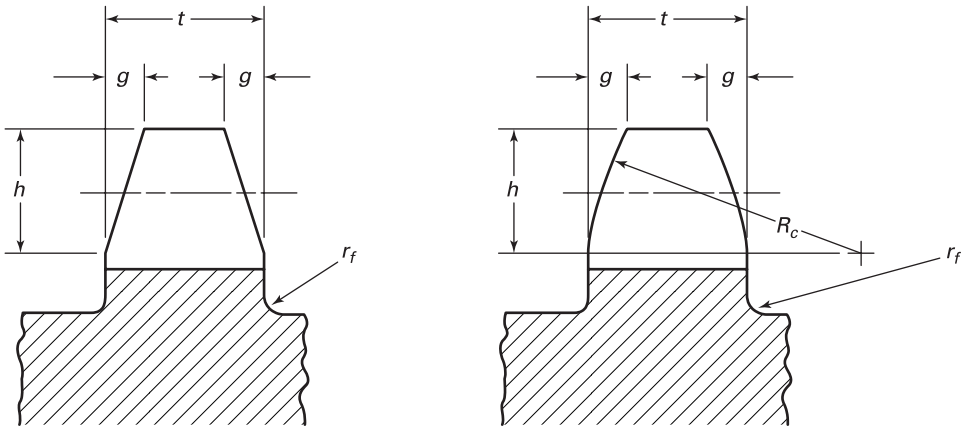
Section A **Section B**

g = width of chamfer
= approximately $\frac{1}{8}P$ (but not to exceed $W/3$)
h = depth of chamfer
= approximately $0.5P$
P = chain pitch
R_c = chamfer radius
= $1.063P$ (approximately tangent to side)
r_f max. = fillet radius
= $0.04P$ for maximum hub diameter
t = maximum sprocket flange thickness
W = nominal chain width (see Table 1 and Fig. 5)

Standard Chain No.	Chain Pitch, P	Depth of Chamfer, h	Width of Chamfer, g	Chamfer Radius, R_c	Transverse Pitch, K	
					Standard Series	Heavy Series
25	0.250	0.125	0.031	0.265	0.252	. . .
35	0.375	0.188	0.047	0.398	0.399	. . .
41	0.500	0.250	0.062	0.531	. . .	. . .
40	0.500	0.250	0.062	0.531	0.566	. . .
50	0.625	0.312	0.078	0.664	0.713	. . .
60	0.750	0.375	0.094	0.796	0.897	1.028
80	1.000	0.500	0.125	1.062	1.153	1.283
100	1.250	0.625	0.156	1.327	1.408	1.539
120	1.500	0.750	0.188	1.593	1.789	1.924
140	1.750	0.875	0.219	1.858	1.924	2.055
160	2.000	1.000	0.250	2.124	2.305	2.437
180	2.250	1.125	0.281	2.392	2.592	2.723
200	2.500	1.250	0.312	2.654	2.817	3.083
240	3.000	1.500	0.375	3.187	3.458	3.985

GENERAL NOTE: The sprocket chamfer dimensions, R_c, g, and h, are noncritical and are given only as a guide for general design proportions.

Table 7M Sprocket Tooth Section Profile Dimensions of Commercial and Precision Sprockets, mm



Section A Section B

g = width of chamfer
= approximately $\frac{1}{8}P$ (but not to exceed $W/3$)
h = depth of chamfer
= approximately $0.5P$
P = chain pitch
R_c = chamfer radius
= $1.063P$ (approximately tangent to side)
r_f max. = fillet radius
= $0.04P$ for maximum hub diameter
t = maximum sprocket flange thickness
W = nominal chain width (see Table 1M and Fig. 5)

Standard Chain No.	Chain Pitch, P	Depth of Chamfer, h	Width of Chamfer, g	Chamfer Radius, R_c	Transverse Pitch, K	
					Standard Series	Heavy Series
25	6.35	3.18	0.787	6.73	6.40	. . .
35	9.52	4.78	1.19	10.11	10.13	. . .
41	12.70	6.35	1.57	13.49	. . .	. . .
40	12.70	6.35	1.57	13.49	14.38	. . .
50	15.88	7.92	1.98	16.87	18.11	. . .
60	19.05	9.52	2.39	20.22	22.78	26.11
80	25.40	12.70	3.18	26.97	29.29	32.59
100	31.75	15.88	3.96	33.71	35.76	39.09
120	38.10	19.05	4.78	40.46	45.44	48.87
140	44.45	22.22	5.56	47.19	48.87	52.20
160	50.80	25.40	6.35	53.95	58.55	61.90
180	57.15	28.58	7.14	60.76	65.84	69.16
200	63.50	31.75	7.92	67.41	71.55	78.31
240	76.20	38.10	9.52	80.95	87.83	101.22

GENERAL NOTE: The sprocket chamfer dimensions, R_c, g, and h, are noncritical and are given only as a guide for general design proportions.

Table 8 Maximum Eccentricity and Face Runout Tolerances for Commercial Sprockets (Measured as Total Indicator Reading), in.

Sprocket Bottom Diameter, *BD*	Maximum Eccentricity	Maximum Face Runout
0–7.000	0.010 + 0.001(*BD*)	0.020
7.001–20.000	0.010 + 0.001(*BD*)	0.003(*BD*)
20.001–30.000	0.030	0.003(*BD*)
30.001 and over	0.030	0.090

Table 9 Maximum Eccentricity and Face Runout Tolerances for Precision Sprockets (Measured as Total Indicator Reading), in.

Sprocket Bottom Diameter, *BD*	Maximum Eccentricity	Maximum Face Runout
0–4.000	0.006	0.010
4.001–6.000	0.008	0.010
6.001–10.000	0.010	0.010
10.001–26.000	0.001(*BD*)	0.001(*BD*)
26.001–40.000	0.026	0.001(*BD*)
40.001 and over	0.026	0.040

Table 8M Maximum Eccentricity and Face Runout Tolerances for Commercial Sprockets (Measured as Total Indicator Reading), mm

Sprocket Bottom Diameter, *BD*	Maximum Eccentricity	Maximum Face Runout
0–177.80	0.25 + 0.001(*BD*)	0.51
177.81–508.00	0.25 + 0.001(*BD*)	0.003(*BD*)
508.01–762.00	0.76	0.003(*BD*)
762.01 and over	0.76	2.29

Table 9M Maximum Eccentricity and Face Runout Tolerances for Precision Sprockets (Measured as Total Indicator Reading), mm

Sprocket Bottom Diameter, *BD*	Maximum Eccentricity	Maximum Face Runout
0–101.60	0.15	0.25
101.61–152.40	0.20	0.25
152.41–254.00	0.25	0.25
254.01–660.40	0.001(*BD*)	0.001(*BD*)
660.41–1 016.00	0.66	0.001(*BD*)
1 016.01 and over	0.66	1.02

Table 10 Sprocket Flange Thickness, in.

Standard Chain No.	Nominal Chain Width, *W*	Maximum Sprocket Flange Thickness, *t*			Minus Tolerance on *t*		Tolerance on *M*		Maximum Variation of *t* on Each Flange	
		Single	Double and Triple	Quad. and Over	Commercial	Precision	Commercial, Plus or Minus	Precision, Minus Only	Commercial	Precision
25	0.125	0.110	0.106	0.096	0.021	0.007	0.007	0.007	0.021	0.004
35	0.188	0.169	0.163	0.150	0.027	0.008	0.008	0.008	0.027	0.004
41	0.250	0.226	. . .	. . .	0.032	0.009	. . .	. . .	0.032	0.004
40	0.312	0.284	0.275	0.256	0.035	0.009	0.009	0.009	0.035	0.004
50	0.375	0.343	0.332	0.310	0.036	0.010	0.010	0.010	0.036	0.005
60	0.500	0.459	0.444	0.418	0.036	0.011	0.011	0.011	0.036	0.006
80	0.625	0.575	0.556	0.526	0.040	0.012	0.012	0.012	0.040	0.006
100	0.750	0.692	0.669	0.633	0.046	0.014	0.014	0.014	0.046	0.007
120	1.000	0.924	0.894	0.848	0.057	0.016	0.016	0.016	0.057	0.008
140	1.000	0.924	0.894	0.848	0.057	0.016	0.016	0.016	0.057	0.008
160	1.250	1.156	1.119	1.063	0.062	0.018	0.018	0.018	0.062	0.009
180	1.406	1.302	1.259	1.198	0.068	0.020	0.020	0.020	0.068	0.010
200	1.500	1.389	1.344	1.278	0.072	0.021	0.021	0.021	0.072	0.010
240	1.875	1.738	1.682	1.602	0.087	0.025	0.025	0.025	0.087	0.012

Table 10M Sprocket Flange Thickness, mm

Standard Chain No.	Nominal Chain Width, *W*	Maximum Sprocket Flange Thickness, *t*			Minus Tolerance on *t*		Tolerance on *M*		Maximum Variation of *t* on Each Flange	
		Single	Double and Triple	Quad. and Over	Commercial	Precision	Commercial, Plus or Minus	Precision, Minus Only	Commercial	Precision
25	3.18	2.79	2.69	2.44	0.53	0.18	0.18	0.18	0.53	0.10
35	4.78	4.29	4.14	3.81	0.69	0.20	0.20	0.20	0.69	0.10
41	6.35	5.74	. . .	. . .	0.81	0.23	. . .	. . .	0.81	0.10
40	7.92	7.21	6.98	6.50	0.89	0.23	0.23	0.23	0.89	0.10
50	9.52	8.71	8.43	7.87	0.91	0.25	0.25	0.25	0.91	0.13
60	12.70	11.66	11.28	10.62	0.91	0.28	0.28	0.28	0.91	0.15
80	15.88	14.60	14.12	13.36	1.02	0.30	0.30	0.30	1.02	0.15
100	19.05	17.58	16.99	16.08	1.17	0.36	0.36	0.36	1.17	0.18
120	25.40	23.47	22.71	21.54	1.45	0.41	0.41	0.41	1.45	0.20
140	25.40	23.47	22.71	21.54	1.45	0.41	0.41	0.41	1.45	0.20
160	31.75	29.36	28.42	27.00	1.57	0.46	0.46	0.46	1.57	0.23
180	35.71	33.07	31.98	30.43	1.73	0.51	0.51	0.51	1.73	0.25
200	38.10	35.28	34.14	32.46	1.83	0.53	0.53	0.53	1.83	0.25
240	47.62	44.15	42.72	40.69	2.21	0.64	0.64	0.64	2.21	0.30

Table 11 Seating Curve Dimensions and Tolerances, in.

Chain Pitch, P	Maximum Roller Diameter, D_r	Minimum Seating Curve Radius, R	Minimum Seating Curve Diameter, D_s	Plus Tolerance on D_s [Note (1)]
0.250	0.130	0.0670	0.134	0.0055
0.375	0.200	0.1020	0.204	0.0055
0.500	0.306, 0.312	0.1585	0.317	0.0060
0.625	0.400	0.2025	0.405	0.0060
0.750	0.469	0.2370	0.474	0.0065
1.000	0.625	0.3155	0.631	0.0070
1.250	0.750	0.3785	0.757	0.0070
1.500	0.875	0.4410	0.882	0.0075
1.750	1.000	0.5040	1.008	0.0080
2.000	1.125	0.5670	1.134	0.0085
2.250	1.406	0.7080	1.416	0.0090
2.500	1.562	0.7870	1.573	0.0095
3.000	1.875	0.9435	1.887	0.0105

NOTE:
(1) Plus only; no minus tolerance.

Table 11M Seating Curve Dimensions and Tolerances, mm

Chain Pitch, P	Maximum Roller Diameter, D_r	Minimum Seating Curve Radius, R	Minimum Seating Curve Diameter, D_s	Plus Tolerance on D_s [Note (1)]
6.35	3.30	1.70	3.40	0.14
9.52	5.08	2.59	5.18	0.14
12.70	7.77, 7.92	4.03	8.05	0.15
15.88	10.16	5.14	10.29	0.15
19.05	11.91	6.02	12.04	0.17
25.40	15.88	8.01	16.03	0.18
31.75	19.05	9.61	19.23	0.18
38.10	22.22	11.20	22.40	0.19
44.45	25.40	12.80	25.60	0.20
50.80	28.58	14.40	28.80	0.22
57.15	35.71	17.98	35.97	0.23
63.50	39.67	19.99	39.95	0.24
76.20	47.62	23.96	47.93	0.27

NOTE:
(1) Plus only; no minus tolerance.

Table 12 Minus Tolerances on the Caliper Diameters of Commercial Sprockets for Various Numbers of Teeth, in.

Chain Pitch, *P*	Number of Teeth									
	Up to 15	16–24	25–35	36–48	49–63	64–80	81–99	100–120	121–143	144 and Over
0.250	0.008	0.008	0.008	0.010	0.010	0.010	0.010	0.012	0.012	0.012
0.375	0.008	0.008	0.008	0.010	0.010	0.012	0.012	0.012	0.014	0.014
0.500	0.008	0.010	0.011	0.012	0.013	0.014	0.015	0.016	0.017	0.018
0.625	0.010	0.011	0.012	0.014	0.016	0.018	0.018	0.018	0.020	0.022
0.750	0.010	0.012	0.014	0.016	0.018	0.020	0.020	0.022	0.024	0.026
1.000	0.012	0.014	0.016	0.018	0.020	0.022	0.024	0.026	0.028	0.030
1.250	0.014	0.016	0.018	0.020	0.024	0.026	0.028	0.032	0.034	0.036
1.500	0.014	0.018	0.021	0.024	0.026	0.030	0.032	0.036	0.038	0.042
1.750	0.016	0.020	0.024	0.026	0.030	0.034	0.038	0.040	0.044	0.048
2.000	0.018	0.022	0.026	0.030	0.034	0.038	0.042	0.046	0.050	0.054
2.250	0.020	0.024	0.028	0.032	0.036	0.042	0.046	0.050	0.056	0.060
2.500	0.020	0.026	0.030	0.036	0.040	0.046	0.050	0.056	0.060	0.066
3.000	0.024	0.030	0.036	0.042	0.048	0.054	0.060	0.066	0.072	0.078

GENERAL NOTE: No plus tolerances.

Table 12M Minus Tolerances on the Caliper Diameters of Commercial Sprockets for Various Numbers of Teeth, mm

Chain Pitch, *P*	Number of Teeth									
	Up to 15	16–24	25–35	36–48	49–63	64–80	81–99	100–120	121–143	144 and Over
6.35	0.20	0.20	0.20	0.25	0.25	0.25	0.25	0.30	0.30	0.30
9.52	0.20	0.20	0.20	0.25	0.25	0.30	0.30	0.30	0.36	0.36
12.70	0.20	0.25	0.28	0.30	0.33	0.36	0.38	0.41	0.43	0.46
15.88	0.25	0.28	0.30	0.36	0.41	0.46	0.46	0.46	0.51	0.56
19.05	0.25	0.30	0.36	0.41	0.46	0.51	0.51	0.56	0.61	0.66
25.40	0.30	0.36	0.41	0.46	0.51	0.56	0.61	0.66	0.71	0.76
31.75	0.36	0.41	0.46	0.51	0.61	0.66	0.71	0.81	0.86	0.91
38.10	0.36	0.46	0.53	0.61	0.66	0.76	0.81	0.91	0.97	1.07
44.45	0.41	0.51	0.61	0.66	0.76	0.86	0.97	1.02	1.12	1.22
50.80	0.46	0.56	0.66	0.76	0.86	0.97	1.07	1.17	1.27	1.37
57.15	0.51	0.61	0.71	0.81	0.91	1.07	1.17	1.27	1.42	1.52
63.50	0.51	0.66	0.76	0.91	1.02	1.17	1.27	1.42	1.52	1.68
76.20	0.61	0.76	0.91	1.07	1.22	1.37	1.52	1.68	1.83	1.98

GENERAL NOTE: No plus tolerances.

Table 13 Minus Tolerances on the Caliper Diameters of Precision Sprockets for Various Numbers of Teeth, in.

Chain Pitch, *P*	Number of Teeth									
	Up to 15	16–24	25–35	36–48	49–63	64–80	81–99	100–120	121–143	144 and Over
0.250	0.004	0.004	0.004	0.005	0.005	0.005	0.005	0.006	0.006	0.006
0.375	0.004	0.004	0.004	0.005	0.005	0.006	0.006	0.006	0.007	0.007
0.500	0.004	0.005	0.0055	0.006	0.0065	0.007	0.0075	0.008	0.0085	0.009
0.625	0.005	0.0055	0.006	0.007	0.008	0.009	0.009	0.009	0.010	0.011
0.750	0.005	0.006	0.007	0.008	0.009	0.010	0.010	0.011	0.012	0.013
1.000	0.006	0.007	0.008	0.009	0.010	0.011	0.012	0.013	0.014	0.015
1.250	0.007	0.008	0.009	0.010	0.012	0.013	0.014	0.016	0.017	0.018
1.500	0.007	0.009	0.0105	0.012	0.013	0.015	0.016	0.018	0.019	0.021
1.750	0.008	0.010	0.012	0.013	0.015	0.017	0.019	0.020	0.022	0.024
2.000	0.009	0.011	0.013	0.015	0.017	0.019	0.021	0.023	0.025	0.027
2.250	0.010	0.012	0.014	0.016	0.018	0.021	0.023	0.025	0.028	0.030
2.500	0.010	0.013	0.015	0.018	0.020	0.023	0.025	0.028	0.030	0.033
3.000	0.012	0.015	0.018	0.021	0.024	0.027	0.030	0.033	0.036	0.039

GENERAL NOTE: No plus tolerances.

Table 13M Minus Tolerances on the Caliper Diameters of Precision Sprockets for Various Numbers of Teeth, mm

Chain Pitch, *P*	Number of Teeth									
	Up to 15	16–24	25–35	36–48	49–63	64–80	81–99	100–120	121–143	144 and Over
6.35	0.10	0.10	0.10	0.13	0.13	0.13	0.13	0.15	0.15	0.15
9.52	0.10	0.10	0.10	0.13	0.13	0.15	0.15	0.15	0.18	0.18
12.70	0.10	0.13	0.14	0.15	0.17	0.18	0.19	0.20	0.22	0.23
15.88	0.13	0.14	0.15	0.18	0.20	0.23	0.23	0.23	0.25	0.28
19.05	0.13	0.15	0.18	0.20	0.23	0.25	0.25	0.28	0.30	0.33
25.40	0.15	0.18	0.20	0.23	0.25	0.28	0.30	0.33	0.36	0.38
31.75	0.18	0.20	0.23	0.25	0.30	0.33	0.36	0.41	0.43	0.46
38.10	0.18	0.23	0.27	0.30	0.33	0.38	0.41	0.46	0.48	0.53
44.45	0.20	0.25	0.30	0.33	0.38	0.43	0.48	0.51	0.56	0.61
50.80	0.23	0.28	0.33	0.38	0.43	0.48	0.53	0.58	0.64	0.69
57.15	0.25	0.30	0.36	0.41	0.46	0.53	0.58	0.64	0.71	0.76
63.50	0.25	0.33	0.38	0.46	0.51	0.58	0.64	0.71	0.76	0.84
76.20	0.30	0.38	0.46	0.53	0.61	0.69	0.76	0.84	0.91	0.99

GENERAL NOTE: No plus tolerances.

Table 14 Pitch Diameter, Outside Diameter, and Measuring Dimension Factor for Chain of Unity Pitch

Number of Teeth	Pitch Diameter	Turned Outside Diameter	Topping Hob Cut Outside Diameter	Caliper Diameter Factor	Number of Teeth	Pitch Diameter	Turned Outside Diameter	Topping Hob Cut Outside Diameter	Caliper Diameter Factor
5	1.7013	1.976	1.976	1.6180	49	15.6079	16.176	16.180	15.5999
6	2.0000	2.332	2.332	...	50	15.9260	16.495	16.498	...
7	2.3048	2.676	2.691	2.2470	51	16.2441	16.813	16.816	16.2364
8	2.6131	3.014	3.000	...	52	16.5622	17.132	17.134	...
9	2.9238	3.348	3.364	2.8794	53	16.8803	17.451	17.452	16.8729
10	3.2361	3.678	3.676	...	54	17.1984	17.769	17.770	...
11	3.5495	4.006	3.990	3.5133	55	17.5165	18.088	18.089	17.5094
12	3.8637	4.332	4.352	...	56	17.8347	18.407	18.407	...
13	4.1786	4.657	4.666	4.1481	57	18.1528	18.725	18.725	18.1459
14	4.4940	4.981	4.982	...	58	18.4710	19.044	19.043	...
15	4.8097	5.304	5.298	4.7834	59	18.7892	19.363	19.361	18.7825
16	5.1258	5.627	5.614	...	60	19.1073	19.681	19.680	...
17	5.4422	5.949	5.930	5.4190	61	19.4255	20.000	19.998	19.4190
18	5.7588	6.271	6.292	...	62	19.7437	20.318	20.316	...
19	6.0755	6.593	6.609	6.0548	63	20.0618	20.637	20.634	20.0556
20	6.3924	6.914	6.926	...	64	20.3800	20.956	20.952	...
21	6.7095	7.235	7.243	6.6907	65	20.6982	21.274	21.270	20.6921
22	7.0267	7.555	7.560	...	66	21.0164	21.593	21.588	...
23	7.3439	7.876	7.877	7.3268	67	21.3346	21.911	21.907	21.3287
24	7.6613	8.196	8.195	...	68	21.6528	22.230	22.225	...
25	7.9787	8.516	8.512	7.9630	69	21.9710	22.548	22.543	21.9653
26	8.2962	8.836	8.829	...	70	22.2892	22.867	22.861	...
27	8.6138	9.156	9.147	8.5992	71	22.6074	23.185	23.179	22.6018
28	8.9314	9.475	9.465	...	72	22.9256	23.504	23.498	...
29	9.2491	9.795	9.782	9.2355	73	23.2438	23.822	23.816	23.2384
30	9.5668	10.114	10.100	...	74	23.5620	24.141	24.134	...
31	9.8845	10.434	10.418	9.8718	75	23.8802	24.459	24.452	23.8750
32	10.2023	10.753	10.736	...	76	24.1984	24.778	24.770	...
33	10.5201	11.073	11.053	10.5082	77	24.5166	25.096	25.089	24.5116
34	10.8379	11.392	11.371	...	78	24.8349	25.415	25.407	...
35	11.1558	11.711	11.728	11.1446	79	25.1531	25.733	25.725	25.1481
36	11.4737	12.030	12.046	...	80	25.4713	26.052	26.043	...
37	11.7916	12.349	12.364	11.7810	81	25.7896	26.370	26.362	25.7847
38	12.1095	12.668	12.682	...	82	26.1078	26.689	26.680	...
39	12.4275	12.987	13.000	12.4174	83	26.4260	27.007	26.998	26.4213
40	12.7455	13.306	13.318	...	84	26.7443	27.326	27.316	...
41	13.0635	13.625	13.636	13.0539	85	27.0625	27.644	27.635	27.0579
42	13.3815	13.944	13.954	...	86	27.3807	27.962	27.953	...
43	13.6995	14.263	14.272	13.6904	87	27.6990	28.281	28.271	27.6945
44	14.0175	14.582	14.590	...	88	28.0172	28.599	28.589	...
45	14.3355	14.901	14.908	14.3269	89	28.3354	28.918	28.907	28.3310
46	14.6536	15.219	15.226	...	90	28.6537	29.236	29.226	...
47	14.9717	15.538	15.544	14.9634	91	28.9719	29.555	29.544	28.9676
48	15.2898	15.857	15.862	...	92	29.2902	29.873	29.862	...

Table 14 Pitch Diameter, Outside Diameter, and Measuring Dimension Factor for Chain of Unity Pitch (Cont'd)

Number of Teeth	Pitch Diameter	Turned Outside Diameter	Topping Hob Cut Outside Diameter	Caliper Diameter Factor	Number of Teeth	Pitch Diameter	Turned Outside Diameter	Topping Hob Cut Outside Diameter	Caliper Diameter Factor
93	29.6081	30.192	30.180	29.6042	137	43.6123	44.201	44.184	43.6094
94	29.9267	30.510	30.499	. . .	138	43.9306	44.519	44.503	. . .
95	30.2449	30.828	30.817	30.2408	139	44.2488	44.838	44.821	44.2460
96	30.5632	31.147	31.135	. . .	140	44.5671	45.156	45.139	. . .
97	30.8815	31.465	31.454	30.8774	141	44.8854	45.474	45.457	44.8826
98	31.1997	31.784	31.772	. . .	142	45.2037	45.793	45.776	. . .
99	31.5180	32.102	32.090	31.5140	143	45.5220	46.111	46.094	45.5192
100	31.8362	32.421	32.408	. . .	144	45.8402	46.429	46.412	. . .
101	32.1545	32.739	32.727	32.1506	145	46.1585	46.748	46.731	46.1558
102	32.4727	33.057	33.045	. . .	146	46.4768	47.066	47.049	. . .
103	32.7910	33.376	33.363	32.7872	147	46.7951	47.384	47.367	46.7924
104	33.1093	33.694	33.681	. . .	148	47.1134	47.703	47.685	. . .
105	33.4275	34.013	34.000	33.4238	149	47.4317	48.021	48.004	47.4290
106	33.7458	34.331	34.318	. . .	150	47.7500	48.340	48.322	. . .
107	34.0641	34.649	34.636	34.0604	151	48.0683	48.658	48.640	48.0657
108	34.3823	34.968	34.954	. . .	152	48.3865	48.976	48.959	. . .
109	34.7006	35.286	35.273	34.6970	153	48.7048	49.295	49.277	48.7023
110	35.0188	35.605	35.591	. . .	154	49.0231	49.613	49.595	. . .
111	35.3371	35.923	35.909	35.3336	155	49.3414	49.931	49.913	49.3389
112	35.6554	36.241	36.227	. . .	156	49.6597	50.250	50.232	. . .
113	35.9736	36.560	36.546	35.9702	157	49.9780	50.568	50.550	49.9755
114	36.2919	36.878	36.864		158	50.2963	50.886	50.868	. . .
115	36.6102	37.197	37.182	36.6068	159	50.6146	51.205	51.187	50.6121
116	36.9285	37.515	37.501	. . .	160	50.9329	51.523	51.505	. . .
117	37.2467	37.833	37.819	37.2434	161	51.2511	51.841	51.823	51.2487
118	37.5650	38.152	38.137	. . .	162	51.5694	52.160	52.141	. . .
119	37.8833	38.470	38.455	37.8800	163	51.8877	52.478	52.460	51.8853
120	38.2015	38.788	38.774	. . .	164	52.2060	52.796	52.778	. . .
121	38.5198	39.107	39.092	38.5166	165	52.5243	53.115	53.096	52.5219
122	38.8381	39.425	39.410	. . .	166	52.8426	53.433	53.415	. . .
123	39.1564	39.744	39.728	39.1532	167	53.1609	53.752	53.733	53.1585
124	39.4746	40.062	40.047	. . .	168	53.4792	54.070	54.051	. . .
125	39.7929	40.380	40.365	39.7898	169	53.7975	54.388	54.370	53.7951
126	40.1112	40.699	40.683	. . .	170	54.1157	54.707	54.688	. . .
127	40.4295	41.017	41.002	40.4264	171	54.4340	55.025	55.006	54.4317
128	40.7477	41.335	41.320	. . .	172	54.7523	55.343	55.324	. . .
129	41.0660	41.654	41.638	41.0630	173	55.0706	55.662	55.643	55.0684
130	41.3843	41.972	41.956	. . .	174	55.3889	55.980	55.961	. . .
131	41.7026	42.291	42.275	41.6996	175	55.7072	56.298	56.279	55.7050
132	42.0209	42.609	42.593	. . .	176	56.0255	56.617	56.598	. . .
133	42.3392	42.927	42.911	42.3362	177	56.3438	56.935	56.916	56.3416
134	42.6574	43.246	43.229	. . .	178	56.6621	57.253	57.234	. . .
135	42.9757	43.564	43.548	42.9728	179	56.9804	57.572	57.552	56.9782
136	43.2940	43.882	43.866	. . .	180	57.2987	57.890	57.871	. . .

Table 14 Pitch Diameter, Outside Diameter, and Measuring Dimension Factor for Chain of Unity Pitch (Cont'd)

Number of Teeth	Pitch Diameter	Turned Outside Diameter	Topping Hob Cut Outside Diameter	Caliper Diameter Factor	Number of Teeth	Pitch Diameter	Turned Outside Diameter	Topping Hob Cut Outside Diameter	Caliper Diameter Factor
181	57.6170	58.208	58.189	57.6148	191	60.7999	61.392	61.372	60.7979
182	57.9353	58.527	58.507	. . .	192	61.1182	61.710	61.690	. . .
183	58.2536	58.845	58.826	58.2514					
184	58.5719	59.163	59.144	. . .	193	61.4365	62.028	62.009	61.4345
					194	61.7548	62.347	62.327	. . .
185	58.8901	59.482	59.462	58.8880	195	62.0731	62.665	62.645	62.0711
186	59.2084	59.800	59.780	. . .	196	62.3914	62.983	62.963	. . .
187	59.5267	60.118	60.099	59.5246					
188	59.8450	60.437	60.417	. . .	197	62.7097	63.302	63.282	62.7077
					198	63.0280	63.620	63.600	. . .
189	60.1633	60.755	60.735	60.1612	199	63.3463	63.938	63.918	63.3443
190	60.4816	61.073	61.054	. . .	200	63.6646	64.257	64.237	. . .

Table 15 Whole Depth of Topping Hob Cut, *WD*, for Each Pitch and Range, in.

Teeth Range	Number of Teeth, N_a	Chain Pitch, *P*												
		0.250	0.375	0.500 [Note (1)]	0.625	0.750	1.00	1.25	1.50	1.75	2.00	2.25	2.50	3.00
5	5	0.0994	0.1516	0.2248	0.2860	0.3377	0.4500	0.5469	0.6438	0.7407	0.8376	1.0125	1.1253	1.3501
6	6	0.1065	0.1623	0.2390	0.3038	0.3590	0.4785	0.5825	0.6865	0.7905	0.8945	1.0766	1.1966	1.4356
7–8	7.47	0.1133	0.1725	0.2526	0.3208	0.3795	0.5058	0.6166	0.7274	0.8382	0.9491	1.1379	1.2647	1.5173
9–11	9.9	0.1200	0.1825	0.2660	0.3375	0.3995	0.5325	0.6500	0.7675	0.8850	1.0025	1.1980	1.3315	1.5975
12–17	14.07	0.1260	0.1915	0.2780	0.3525	0.4175	0.5564	0.6799	0.8034	0.9269	1.0504	1.2519	1.3914	1.6693
18–34	23.54	0.1316	0.2000	0.2890	0.3666	0.4344	0.5791	0.7082	0.8374	0.9665	1.0957	1.3028	1.4480	1.7373
35 and over	56	0.1365	0.2072	0.2990	0.3787	0.4490	0.5985	0.7325	0.8665	1.0004	1.1344	1.3464	1.4964	1.7954

NOTE:
(1) Roller diameter 0.312 in.

Table 15M Whole Depth of Topping Hob Cut, *WD*, for Each Pitch and Range, mm

Teeth Range	Number of Teeth, N_a	Chain Pitch, *P*												
		6.35	9.52	12.70 [Note (1)]	15.88	19.05	25.4	31.75	38.10	44.45	50.80	57.15	63.50	76.20
5	5	2.525	3.851	5.710	7.264	8.578	11.430	13.891	16.353	18.814	21.275	25.718	28.583	34.293
6	6	2.705	4.122	6.071	7.717	9.119	12.154	14.796	17.437	20.079	22.720	27.346	30.394	36.464
7–8	7.47	2.878	4.382	6.416	8.148	9.639	12.847	15.662	18.476	21.290	24.107	28.903	32.123	38.539
9–11	9.9	3.048	4.636	6.756	8.573	10.147	13.526	16.510	19.495	22.479	25.464	30.429	33.820	40.577
12–17	14.07	3.200	4.864	7.061	8.954	10.605	14.133	17.269	20.406	23.543	26.680	31.798	35.342	42.400
18–34	23.54	3.343	5.080	7.341	9.312	11.034	14.709	17.988	21.270	24.549	27.831	33.091	36.779	44.127
35 and over	56	3.467	5.263	7.595	9.619	11.405	15.202	18.606	22.009	25.410	28.814	34.199	38.009	45.603

NOTE:
(1) Roller diameter 7.925 mm.

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NONMANDATORY APPENDIX A
SUPPLEMENTARY INFORMATION ON CHAIN SELECTION[1]

A-1 DESIGN FACTORS

A-1.1 General

The horsepower ratings in Tables A-4 through A-26 generally apply to lubricated single-pitch, single-strand roller chains for both standard series and heavy series chains defined in this Standard (B29.1). For horsepower ratings of multiple-strand chains, refer to Table A-2. The horsepower ratings reflect a service factor of 1, a chain length of approximately 100 pitches, use of interference-fit connecting links, 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 be expected.

Substantial increases in rated speeds and loads may be utilized, as when a service life of less than 15,000 hr is satisfactory, or when full-load operation is encountered only during a portion of the required service life.

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

A-1.2 Drive Selection

The horsepower ratings relate to the speed of the smaller sprocket, and drive selections are made on this basis, whether the drive is speed reducing or speed increasing.

Drives with more than two sprockets, idlers, composite duty cycles, or other unusual conditions require special consideration. Consult chain manufacturers for selections of this nature.

Where quietness or extra smooth operation are of special importance, a small-pitch chain operating over large-diameter sprockets will minimize noise and vibration.

When making drive selections, consideration is given to the loads imposed on the chain by the type of input power and the type of equipment to be driven. Service factors are used to compensate for these loads, and the required horsepower rating of the chain is determined by the following equation:

$$\text{required hp, table rating} = \frac{\text{hp to be transmitted} \times \text{service factor}}{\text{multiple-strand factor}}$$

A-2 SERVICE FACTORS

The service factors in Table A-1 are for normal chain loading. For unusual or extremely severe operating conditions not shown in this table, it is desirable to use larger service factors.

A-3 MULTIPLE STRAND FACTORS

Horsepower ratings for single-strand chains are shown in Tables A-4 through A-26. The horsepower ratings for multiple-strand chains equal single-strand ratings multiplied by the factors shown in Table A-2.

A-4 LUBRICATION

It has been shown that a separating wedge of fluid lubricant is formed in operating chain joints, much like that formed in journal bearings. Therefore, fluid lubricant must be applied to ensure an oil supply to the joints and minimize metal-to-metal contact. Lubrication, if supplied in sufficient volume, also provides effective cooling and impact damping at the higher speeds. For this reason, it is important that the lubrication recommendations be followed.

NOTES:
(1) The horsepower rating tables apply only to drives lubricated in the manner specified in the tables.
(2) Zero values in the horsepower rating tables indicate speeds beyond the maximum recommended. Operation at these speeds may result in excessive chain joint galling, regardless of the volume of lubricant applied.

Chain drives should be protected against dirt and moisture, and the oil supply should be kept free of contamination. Periodic oil change is desirable. A good grade of nondetergent petroleum-base oil is recommended. Heavy oils and greases are generally too stiff to enter and fill the chain joints. Table A-3 indicates the proper lubricant viscosity for various surrounding temperatures.

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

There are three basic types of lubrication for chain drives. The recommended type shown in the horsepower rating tables is influenced by chain speed and the amount of power transmitted. These are *minimum* lubrication requirements, and the use of a better type (e.g., Type C instead of Type B) is acceptable and may be beneficial. Chain life can vary appreciably, depending upon the way the drive is lubricated. The better the lubrication, the longer the chain life. For this reason, it is important that the lubrication recommendations be followed when using the ratings given in these tables.

A-4.1 Type A — Manual or Drip Lubrication

(a) For manual lubrication, oil is applied copiously with a brush or spout can at least once every 8 hr of operation. Volume and frequency should be sufficient to prevent overheating of the chain or discoloration in the chain joints.

(b) For drip lubrication, oil drops are directed between the link plate edges from a drip lubricator. Volume and frequency should be sufficient to prevent discoloration of lubricant in the chain joints. Precaution must be taken against misdirection of the drops by windage.

A-4.2 Type B — Bath or Disc Lubrication

(a) For bath lubrication, the lower strand of chain runs through a sump of oil in the drive housing. The oil level should reach the pitch line of the chain at its lowest point while operating.

(b) For disc lubrication, the chain operates above the oil level. The disc picks up oil from the sump and deposits it onto the chain, usually by means of a trough. The diameter of the disc should be such as to produce rim speeds between 600 ft/min and 8,000 ft/min.

A-4.3 Type C — Oil Stream Lubrication

The lubricant is usually supplied by a circulating pump capable of supplying each chain drive with a continuous stream of oil. The oil should be directed at the slack strand, and applied inside the chain loop and evenly across the chain width.

Consult chain manufacturers when it appears desirable to use a type of lubrication other than that recommended.

A-5 SPROCKETS

Sprockets should have tooth form, thickness, profile, and diameters conforming to this Standard. Sprockets with fewer than 25 teeth should have an odd number of teeth to equalize wear on all of the teeth. For maximum service life, small sprockets operating at moderate to high speeds, or near the rated horsepower, should have hardened teeth. Normally, large sprockets should not exceed 120 teeth.

A-6 CENTER DISTANCE

In general, a center distance of 30 to 50 chain pitches is most desirable. The distance between the sprocket centers should provide at least 120 deg chain wrap on the smaller sprocket.

Drives may be installed with either adjustable or fixed center distances. Adjustable centers simplify the control of chain slack.

For drives on fixed centers, an idler or shoe may be used to provide slack adjustment. These devices may also be used to control backlash, or to ensure 120 deg minimum chain wrap on the smaller sprocket.

NOTE: Sufficient housing clearance must always be provided for the slack chain to obtain full chain life.

A-7 ALIGNMENT

Accurate alignment of shafts and sprocket tooth faces provides uniform distribution of the load across the entire chain width and contributes substantially to optimum drive life. Shafting, bearings, and foundations should be suitable to maintain the initial alignment. Periodic maintenance should include an inspection of alignment to insure optimum chain life.

A-8 HORSEPOWER RATINGS TABLES

To use the horsepower ratings (Tables A-4 through A-26) properly, the following factors must be taken into consideration:

(a) service factors of Table A-1.

(b) multiple-strand factors of Table A-2.

(c) lubrication. The horsepower established from the sprocket and speed combination of the drive under consideration will indicate a method of lubrication. This method or a better one must be used to obtain optimum chain life.

NOTE: The horsepower ratings permit the use of interference-fit connecting links. Chains using interference-fit offset sections or slip-fit connecting links may not meet these ratings. Chains using slip-fit offset links will not meet these ratings. Consult the chain manufacturer for specific derating factors for their slip-fit connecting links, offset sections, and offset links.

Table A-1 Service Factors

Type of Driven Load	Type of Input Power		
	Internal Combustion Engine With Hydraulic Drive	Electric Motor or Turbine	Internal Combustion Engine With Mechanical Drive
Smooth	1.0	1.0	1.2
Moderate shock	1.2	1.3	1.4
Heavy shock	1.4	1.5	1.7

Table A-2 Multiple-Strand Factors

Number of Strands	Multiple-Strand Factor
2	1.7
3	2.5
4	3.3

Table A-3 Lubricant Viscosity

Temperature, °F (°C)	Recommended Viscosity Grade, SAE (ISO)
−20 to 80 (−29 to 27)	SAE 10 (VG 46)
10 to 110 (−12 to 43)	SAE 20 (VG 68)
20 to 130 (−7 to 54)	SAE 30 (VG 100)
30 to 140 (−1 to 60)	SAE 40 (VG 150)
40 to 150 (4 to 66)	SAE 50 (VG 220)

GENERAL NOTE: When the temperature range permits a choice, the higher viscosity should be used.

Table A-4 Horsepower Ratings, Single Strand Roller Chain No. 25 (0.250 in. Pitch)

No. of Teeth	Speed, Revolutions/min, Small Sprocket																								
	50	100	300	365	500	700	900	1,200	1,500	1,800	2,100	2,500	3,000	3,500	4,000	4,500	5,000	5,500	6,000	7,000	8,000	9,000	10,000	11,000	12,000
11	0.03	0.06	0.19	0.22	0.30	0.42	0.53	0.70	0.87	1.03	1.20	1.42	1.69	1.69	1.38	1.16	0.99	0.86	0.75	0.60	0.49	0.41	0.35	0.30	0.27
12	0.04	0.07	0.20	0.24	0.33	0.46	0.58	0.76	0.95	1.13	1.31	1.55	1.84	1.92	1.57	1.32	1.12	0.97	0.86	0.68	0.56	0.47	0.40	0.34	0.30
13	0.04	0.08	0.22	0.26	0.36	0.49	0.63	0.83	1.03	1.22	1.42	1.67	1.99	2.17	1.77	1.49	1.27	1.10	0.96	0.77	0.63	0.53	0.45	0.39	0.34
14	0.04	0.08	0.24	0.28	0.38	0.53	0.68	0.89	1.10	1.32	1.52	1.80	2.15	2.42	1.98	1.66	1.42	1.23	1.08	0.86	0.70	0.59	0.50	0.43	0.38
15	0.05	0.09	0.25	0.30	0.41	0.57	0.72	0.95	1.18	1.41	1.63	1.93	2.30	2.67	2.20	1.84	1.57	1.36	1.20	0.95	0.78	0.65	0.56	0.48	0.42
16	0.05	0.09	0.27	0.32	0.44	0.61	0.77	1.02	1.26	1.50	1.74	2.06	2.45	2.85	2.42	2.03	1.73	1.50	1.32	1.05	0.86	0.72	0.61	0.53	0.47
17	0.05	0.10	0.29	0.35	0.47	0.64	0.82	1.08	1.34	1.60	1.85	2.19	2.61	3.02	2.65	2.22	1.90	1.64	1.44	1.14	0.94	0.79	0.67	0.58	0.51
18	0.05	0.11	0.30	0.37	0.49	0.68	0.87	1.15	1.42	1.69	1.96	2.32	2.76	3.20	2.89	2.42	2.07	1.79	1.57	1.25	1.02	0.86	0.73	0.63	0.56
19	0.06	0.11	0.32	0.39	0.52	0.72	0.92	1.21	1.50	1.78	2.07	2.45	2.91	3.38	3.13	2.62	2.24	1.94	1.70	1.35	1.11	0.93	0.79	0.69	0.00
20	0.06	0.12	0.34	0.41	0.55	0.76	0.97	1.27	1.58	1.88	2.18	2.58	3.07	3.56	3.38	2.83	2.42	2.10	1.84	1.46	1.20	1.00	0.86	0.74	0.00
21	0.06	0.12	0.35	0.43	0.58	0.80	1.01	1.34	1.66	1.97	2.29	2.70	3.22	3.74	3.64	3.05	2.60	2.26	1.98	1.57	1.29	1.08	0.92	0.00	
22	0.07	0.13	0.37	0.45	0.60	0.83	1.06	1.40	1.73	2.07	2.40	2.83	3.37	3.91	3.90	3.27	2.79	2.42	2.12	1.69	1.38	1.16	0.99	0.00	
23	0.07	0.13	0.39	0.47	0.63	0.87	1.11	1.46	1.81	2.16	2.51	2.96	3.53	4.09	4.17	3.50	2.98	2.59	2.27	1.80	1.47	1.24	1.04	0.00	
24	0.07	0.14	0.40	0.49	0.66	0.91	1.16	1.53	1.89	2.25	2.61	3.09	3.68	4.27	4.45	3.73	3.18	2.76	2.42	1.92	1.57	1.32	0.22	0.00	
25	0.08	0.15	0.42	0.51	0.69	0.95	1.21	1.59	1.97	2.35	2.72	3.22	3.84	4.45	4.73	3.96	3.38	2.93	2.57	2.04	1.67	1.40	0.00		
26	0.08	0.15	0.44	0.53	0.71	0.99	1.26	1.65	2.05	2.44	2.83	3.35	3.99	4.62	5.01	4.20	3.59	3.11	2.73	2.17	1.77	1.49	0.00		
28	0.08	0.16	0.47	0.57	0.77	1.06	1.35	1.78	2.21	2.63	3.05	3.61	4.30	4.98	5.60	4.70	4.01	3.47	3.05	2.42	1.98	0.00			
30	0.09	0.18	0.50	0.61	0.82	1.14	1.45	1.91	2.37	2.82	3.27	3.86	4.60	5.34	6.07	5.21	4.45	3.85	3.38	2.68	1.98	0.00			
32	0.10	0.19	0.54	0.65	0.88	1.21	1.55	2.04	2.52	3.01	3.49	4.12	4.91	5.69	6.47	5.74	4.90	4.25	3.73	2.96	0.35	0.00			
35	0.11	0.21	0.59	0.71	0.96	1.33	1.69	2.23	2.76	3.29	3.81	4.51	5.37	6.23	7.08	6.56	5.60	4.86	4.26	2.76	0.00				
40	0.12	0.23	0.67	0.81	1.10	1.52	1.93	2.55	3.15	3.76	4.36	5.15	6.14	7.11	8.09	8.02	6.85	5.93	4.91	0.00					
45	0.14	0.26	0.76	0.91	1.24	1.71	2.17	2.86	3.55	4.23	4.90	5.79	6.90	8.00	9.10	9.57	8.17	5.23	1.38	0.00					
	Type A [Note (1)]			Type B [Note (2)]										Type C [Note (3)]											

NOTES:
(1) Type A: Manual or drip lubrication
(2) Type B: Bath or disc lubrication
(3) Type C: Oil stream lubrication

Table A-5 Horsepower Ratings, Single Strand Roller Chain No. 35 (0.375 in. Pitch)

No. of Teeth	Speed, Revolutions/min, Small Sprocket																								
	50	100	200	240	500	700	900	1,200	1,500	1,800	2,100	2,500	3,000	3,500	4,000	4,500	5,000	5,500	6,000	6,500	7,000	7,500	8,000	9,000	10,000
11	0.11	0.22	0.42	0.50	1.02	1.41	1.80	2.37	2.93	3.49	4.05	3.86	2.94	2.33	1.91	1.60	1.37	1.18	1.04	0.92	0.82	0.74	0.67	0.57	0.48
12	0.12	0.24	0.46	0.55	1.11	1.54	1.96	2.58	3.20	3.81	4.42	4.40	3.35	2.66	2.17	1.82	1.56	1.35	1.18	1.05	0.94	0.85	0.77	0.64	0.55
13	0.13	0.26	0.50	0.60	1.21	1.67	2.12	2.80	3.47	4.13	4.79	4.96	3.77	3.00	2.45	2.05	1.75	1.52	1.33	1.18	1.06	0.95	0.87	0.73	0.62
14	0.14	0.28	0.54	0.64	1.30	1.80	2.29	3.01	3.73	4.45	5.15	5.55	4.22	3.35	2.74	2.30	1.96	1.70	1.49	1.32	1.18	1.07	0.97	0.81	0.10
15	0.15	0.30	0.58	0.69	1.39	1.92	2.45	3.23	4.00	4.76	5.52	6.15	4.68	3.71	3.04	2.55	2.17	1.88	1.65	1.47	1.31	1.18	1.07	0.90	0.00
16	0.16	0.32	0.62	0.73	1.49	2.05	2.61	3.44	4.26	5.08	5.89	6.77	5.15	4.09	3.35	2.81	2.40	2.08	1.82	1.62	1.45	1.30	1.18	0.44	0.00
17	0.17	0.34	0.65	0.78	1.58	2.18	2.77	3.66	4.53	5.40	6.26	7.40	5.64	4.48	3.67	3.07	2.62	2.27	2.00	1.77	1.58	1.43	1.30	0.00	
18	0.18	0.36	0.69	0.83	1.67	2.31	2.94	3.87	4.80	5.72	6.63	7.83	6.15	4.88	3.99	3.35	2.86	2.48	2.17	1.93	1.73	1.56	1.41	0.00	
19	0.19	0.38	0.73	0.87	1.76	2.44	3.10	4.09	5.06	6.03	7.00	8.27	6.67	5.29	4.33	3.63	3.10	2.69	2.36	2.09	1.87	1.69	0.05	0.00	
20	0.20	0.40	0.77	0.92	1.86	2.56	3.26	4.30	5.33	6.35	7.36	8.71	7.20	5.72	4.68	3.92	3.35	2.90	2.55	2.26	2.02	1.42	0.00		
21	0.21	0.42	0.81	0.96	1.95	2.69	3.43	4.52	5.60	6.67	7.73	9.14	7.75	6.15	5.03	4.22	3.60	3.12	2.74	2.43	2.17	0.00			
22	0.22	0.44	0.85	1.01	2.04	2.82	3.59	4.73	5.86	6.99	8.10	9.58	8.31	6.59	5.40	4.52	3.86	3.35	2.94	2.61	1.42	0.00			
23	0.23	0.46	0.89	1.06	2.14	2.95	3.75	4.95	6.13	7.30	8.47	10.01	8.88	7.05	5.77	4.83	4.13	3.58	3.14	2.79	0.00				
24	0.24	0.48	0.92	1.10	2.23	3.08	3.92	5.16	6.40	7.62	8.84	10.45	9.47	7.51	6.15	5.15	4.40	3.81	3.35	2.04	0.00				
25	0.25	0.50	0.96	1.15	2.32	3.21	4.08	5.38	6.66	7.94	9.20	10.88	10.07	7.99	6.54	5.48	4.68	4.05	3.56	0.12	0.00				
26	0.26	0.51	1.00	1.19	2.41	3.33	4.24	5.59	6.93	8.26	9.57	11.32	10.68	8.47	6.93	5.81	4.96	4.30	3.40	0.00					
28	0.29	0.55	1.08	1.28	2.60	3.59	4.57	6.02	7.46	8.89	10.31	12.19	11.93	9.47	7.75	6.49	5.55	4.81	0.00						
30	0.31	0.59	1.16	1.38	2.79	3.85	4.90	6.45	8.00	9.53	11.05	13.06	13.23	10.50	8.59	7.20	6.15	2.24	0.00						
32	0.33	0.63	1.23	1.47	2.97	4.10	5.22	6.88	8.53	10.16	11.78	13.93	14.58	11.57	9.47	7.93	5.76	0.00							
35	0.36	0.69	1.35	1.61	3.25	4.49	5.71	7.53	9.33	11.11	12.89	15.23	16.67	13.23	10.83	8.85	0.34	0.00							
40	0.41	0.79	1.54	1.84	3.71	5.13	6.53	8.61	10.66	12.70	14.73	17.41	20.37	16.17	11.04	0.34	0.00								
45	0.46	0.89	1.73	2.07	4.18	5.77	7.35	9.68	11.99	14.29	16.57	19.59	23.33	15.56	3.11	0.00									
	Type A [Note (1)]			Type B [Note (2)]							Type C [Note (3)]														

NOTES:

(1) Type A: Manual or drip lubrication

(2) Type B: Bath or disc lubrication

(3) Type C: Oil stream lubrication

Table A-6 Horsepower Ratings, Single Strand Roller Chain No. 40 (0.500 in. Pitch)

No. of Teeth	Speed, Revolutions/min, Small Sprocket																								
	10	25	50	100	180	200	300	500	700	900	1,000	1,200	1,400	1,600	1,800	2,100	2,500	3,000	3,500	4,000	5,000	6,000	7,000	8,000	9,000
11	0.06	0.14	0.27	0.52	0.91	1.00	1.48	2.42	3.34	4.25	4.70	5.60	6.49	5.57	4.66	3.70	2.85	2.17	1.72	1.41	1.01	0.77	0.61	0.50	0.00
12	0.06	0.15	0.29	0.56	0.99	1.09	1.61	2.64	3.64	4.64	5.13	6.11	7.09	6.34	5.31	4.22	3.25	2.47	1.96	1.60	1.15	0.87	0.69	0.57	0.00
13	0.07	0.16	0.31	0.61	1.07	1.19	1.75	2.86	3.95	5.02	5.56	6.62	7.68	7.15	5.99	4.76	3.66	2.79	2.21	1.81	1.29	0.98	0.78	0.00	
14	0.07	0.17	0.34	0.66	1.15	1.28	1.88	3.08	4.25	5.41	5.98	7.13	8.27	7.99	6.70	5.31	4.09	3.11	2.47	2.02	1.45	1.10	0.87	0.00	
15	0.08	0.19	0.36	0.70	1.24	1.37	2.02	3.30	4.55	5.80	6.41	7.64	8.86	8.86	7.43	5.89	4.54	3.45	2.74	2.24	1.60	1.22	0.97	0.00	
16	0.08	0.20	0.39	0.75	1.32	1.46	2.15	3.52	4.86	6.18	6.84	8.15	9.45	9.76	8.18	6.49	5.00	3.80	3.02	2.47	1.77	1.34	0.00		
17	0.09	0.21	0.41	0.80	1.40	1.55	2.29	3.74	5.16	6.57	7.27	8.66	10.04	10.69	8.96	7.11	5.48	4.17	3.31	2.71	1.94	1.47	0.00		
18	0.09	0.22	0.43	0.84	1.48	1.64	2.42	3.96	5.46	6.95	7.69	9.17	10.63	11.65	9.76	7.75	5.97	4.54	3.60	2.95	2.11	1.60	0.00		
19	0.10	0.24	0.46	0.89	1.57	1.73	2.56	4.18	5.77	7.34	8.12	9.68	11.22	12.64	10.59	8.40	6.47	4.92	3.91	3.20	2.29	0.09	0.00		
20	0.10	0.25	0.48	0.94	1.65	1.82	2.69	4.39	6.07	7.73	8.55	10.18	11.81	13.42	11.44	9.07	6.99	5.31	4.22	3.45	2.47	0.00			
21	0.11	0.26	0.51	0.98	1.73	1.91	2.83	4.61	6.37	8.11	8.98	10.69	12.40	14.10	12.30	9.76	7.52	5.72	4.54	3.71	2.66	0.00			
22	0.11	0.27	0.53	1.03	1.81	2.01	2.96	4.83	6.68	8.50	9.40	11.20	12.99	14.77	13.19	10.47	8.06	6.13	4.87	3.98	2.85	0.00			
23	0.12	0.28	0.55	1.08	1.90	2.10	3.10	5.05	6.98	8.89	9.83	11.71	13.58	15.44	14.10	11.19	8.62	6.55	5.20	4.26	3.05	0.00			
24	0.12	0.30	0.58	1.12	1.98	2.19	3.23	5.27	7.28	9.27	10.26	12.22	14.17	16.11	15.03	11.93	9.18	6.99	5.54	4.54	0.87	0.00			
25	0.13	0.31	0.60	1.17	2.06	2.28	3.36	5.49	7.59	9.66	10.69	12.73	14.76	16.78	15.98	12.68	9.76	7.43	5.89	4.82	0.00				
26	0.13	0.32	0.63	1.22	2.14	2.37	3.50	5.71	7.89	10.04	11.11	13.24	15.35	17.45	16.95	13.45	10.36	7.88	6.25	5.12	0.00				
28	0.14	0.35	0.67	1.31	2.31	2.55	3.77	6.15	8.50	10.82	11.97	14.26	16.53	18.79	18.94	15.03	11.57	8.80	6.99	5.72	0.00				
30	0.15	0.37	0.72	1.41	2.47	2.74	4.04	6.59	9.11	11.59	12.82	15.28	17.71	20.14	21.01	16.67	12.84	9.76	7.75	6.34	0.00				
32	0.16	0.40	0.77	1.50	2.64	2.92	4.31	7.03	9.71	12.36	13.68	16.30	18.89	21.48	23.14	18.37	14.14	10.76	8.54	1.41	0.00				
35	0.18	0.43	0.84	1.64	2.88	3.19	4.71	7.69	10.62	13.52	14.96	17.82	20.67	23.49	26.30	21.01	16.17	12.30	9.76	0.00					
40	0.21	0.50	0.96	1.87	3.30	3.65	5.38	8.79	12.14	15.45	17.10	20.37	23.62	26.85	30.06	25.67	19.76	15.03	0.00						
45	0.23	0.56	1.08	2.11	3.71	4.10	6.06	9.89	13.66	17.39	19.24	22.92	26.57	30.20	33.82	30.63	23.58	5.53	0.00						
	Type A [Note (1)]				Type B [Note (2)]									Type C [Note (3)]											

NOTES:
(1) Type A: Manual or drip lubrication
(2) Type B: Bath or disc lubrication
(3) Type C: Oil stream lubrication

Table A-7 Horsepower Ratings, Single Strand Roller Chain No. 41 (0.500 in. Pitch)

No. of Teeth	Speed, Revolutions/min, Small Sprocket																								
	10	25	50	100	180	200	300	500	700	900	1,000	1,200	1,400	1,600	1,800	2,100	2,500	3,000	3,500	4,000	5,000	6,000	7,000	8,000	9,000
11	0.03	0.07	0.15	0.28	0.50	0.55	0.81	1.33	1.84	2.34	2.25	1.71	1.36	1.11	0.93	0.74	0.57	0.43	0.34	0.28	0.20	0.15	0.12	0.10	0.00
12	0.03	0.08	0.16	0.31	0.54	0.60	0.89	1.45	2.00	2.55	2.57	1.95	1.55	1.27	1.06	0.84	0.65	0.49	0.39	0.32	0.23	0.17	0.14	0.11	0.00
13	0.04	0.09	0.17	0.34	0.59	0.65	0.96	1.57	2.17	2.76	2.89	2.20	1.75	1.43	1.20	0.95	0.73	0.56	0.44	0.36	0.26	0.20	0.16	0.00	
14	0.04	0.10	0.19	0.36	0.63	0.70	1.04	1.69	2.34	2.97	3.23	2.46	1.95	1.60	1.34	1.06	0.82	0.62	0.49	0.40	0.29	0.22	0.17	0.00	
15	0.04	0.10	0.20	0.39	0.68	0.75	1.11	1.81	2.50	3.19	3.53	2.73	2.17	1.77	1.49	1.18	0.91	0.69	0.55	0.45	0.32	0.24	0.19	0.00	
16	0.05	0.11	0.21	0.41	0.73	0.80	1.18	1.93	2.67	3.40	3.76	3.01	2.39	1.95	1.64	1.30	1.00	0.76	0.60	0.49	0.35	0.27	0.00		
17	0.05	0.12	0.23	0.44	0.77	0.85	1.26	2.05	2.84	3.61	4.00	3.29	2.61	2.14	1.79	1.42	1.10	0.83	0.66	0.54	0.39	0.29	0.00		
18	0.05	0.12	0.24	0.46	0.82	0.90	1.33	2.18	3.00	3.82	4.23	3.59	2.85	2.33	1.95	1.55	1.19	0.91	0.72	0.59	0.42	0.32	0.00		
19	0.05	0.13	0.25	0.49	0.86	0.95	1.41	2.30	3.17	4.04	4.47	3.89	3.09	2.53	2.12	1.68	1.29	0.98	0.78	0.64	0.46	0.09	0.00		
20	0.06	0.14	0.27	0.52	0.91	1.00	1.48	2.42	3.34	4.25	4.70	4.20	3.33	2.73	2.29	1.81	1.40	1.06	0.84	0.69	0.49	0.00			
21	0.06	0.14	0.28	0.54	0.95	1.05	1.55	2.54	3.51	4.46	4.94	4.52	3.59	2.94	2.46	1.95	1.50	1.14	0.91	0.74	0.53	0.00			
22	0.06	0.15	0.29	0.57	1.00	1.10	1.63	2.66	3.67	4.67	5.17	4.85	3.85	3.15	2.64	2.09	1.61	1.23	0.97	0.80	0.57	0.00			
23	0.07	0.16	0.30	0.59	1.04	1.15	1.70	2.78	3.84	4.89	5.41	5.18	4.11	3.37	2.82	2.24	1.72	1.31	1.04	0.85	0.61	0.00			
24	0.07	0.16	0.32	0.62	1.09	1.20	1.78	2.90	4.01	5.10	5.64	5.52	4.38	3.59	3.01	2.39	1.84	1.40	1.11	0.91	0.65	0.00			
25	0.07	0.17	0.33	0.64	1.13	1.25	1.85	3.02	4.17	5.31	5.88	5.87	4.66	3.81	3.20	2.54	1.95	1.49	1.18	0.96	0.00				
26	0.07	0.18	0.34	0.67	1.18	1.30	1.92	3.14	4.34	5.52	6.11	6.23	4.94	4.05	3.39	2.69	2.07	1.58	1.25	1.02	0.00				
28	0.08	0.19	0.37	0.72	1.27	1.40	2.07	3.38	4.67	5.95	6.58	6.96	5.52	4.52	3.79	3.01	2.31	1.76	1.40	1.14	0.00				
30	0.08	0.20	0.40	0.77	1.36	1.50	2.22	3.63	5.01	6.37	7.05	7.72	6.13	5.01	4.20	3.33	2.57	1.95	1.55	1.27	0.00				
32	0.09	0.22	0.42	0.82	1.45	1.60	2.37	3.87	5.34	6.80	7.52	8.50	6.75	5.52	4.63	3.67	2.83	2.15	1.71	1.40	0.00				
35	0.10	0.24	0.46	0.90	1.59	1.76	2.59	4.23	5.84	7.44	8.23	9.80	7.72	6.32	5.29	4.20	3.23	2.46	1.95	0.00					
40	0.11	0.27	0.53	1.03	1.81	2.01	2.96	4.83	6.68	8.50	9.40	11.20	9.43	7.72	6.47	5.13	3.95	3.01	0.00						
45	0.13	0.31	0.60	1.16	2.04	2.26	3.33	5.44	7.51	9.56	10.58	12.60	11.25	9.21	7.72	6.13	4.72	3.59	0.00						
Type A [Note (1)]					Type B [Note (2)]									Type C [Note (3)]											

NOTES:
(1) Type A: Manual or drip lubrication
(2) Type B: Bath or disc lubrication
(3) Type C: Oil stream lubrication

Table A-8 Horsepower Ratings, Single Strand Roller Chain No. 50 (0.625 in. Pitch)

No. of Teeth	Speed, Revolutions/min, Small Sprocket																								
	10	25	50	100	140	200	300	500	700	900	1,200	1,500	1,800	2,100	2,500	3,000	3,500	4,000	4,500	5,000	5,500	6,000	6,500	7,000	7,500
11	0.11	0.27	0.52	1.00	1.39	1.95	2.88	4.70	6.50	8.27	10.24	7.33	5.58	4.42	3.41	2.59	2.06	1.68	1.41	1.20	1.04	0.92	0.81	0.73	0.00
12	0.12	0.29	0.56	1.09	1.51	2.13	3.14	5.13	7.09	9.02	11.67	8.35	6.35	5.04	3.88	2.95	2.34	1.92	1.61	1.37	1.19	1.04	0.93	0.00	
13	0.13	0.31	0.61	1.19	1.64	2.31	3.40	5.56	7.68	9.77	12.88	9.42	7.16	5.69	4.38	3.33	2.64	2.16	1.81	1.55	1.34	1.18	0.00		
14	0.14	0.34	0.66	1.28	1.76	2.48	3.67	5.99	8.27	10.53	13.87	10.52	8.01	6.35	4.89	3.72	2.95	2.42	2.03	1.73	1.50	0.28	0.00		
15	0.15	0.36	0.70	1.37	1.89	2.66	3.93	6.41	8.86	11.28	14.86	11.67	8.88	7.05	5.42	4.13	3.27	2.68	2.25	1.92	1.66	0.00			
16	0.16	0.39	0.75	1.46	2.02	2.84	4.19	6.84	9.45	12.03	15.85	12.86	9.78	7.76	5.98	4.55	3.61	2.95	2.47	2.11	0.00				
17	0.17	0.41	0.80	1.55	2.14	3.02	4.45	7.27	10.04	12.78	16.85	14.08	10.71	8.50	6.55	4.98	3.95	3.23	2.71	2.31	0.00				
18	0.18	0.43	0.84	1.64	2.27	3.19	4.71	7.70	10.63	13.53	17.84	15.34	11.67	9.26	7.13	5.42	4.30	3.52	2.95	0.05	0.00				
19	0.19	0.46	0.89	1.73	2.39	3.37	4.98	8.12	11.22	14.28	18.83	16.64	12.66	10.05	7.73	5.88	4.67	3.82	3.20	0.00					
20	0.20	0.48	0.94	1.82	2.52	3.55	5.24	8.55	11.81	15.04	19.82	17.97	13.67	10.85	8.35	6.35	5.04	4.13	3.46	0.00					
21	0.21	0.51	0.98	1.92	2.65	3.73	5.50	8.98	12.40	15.79	20.81	19.34	14.71	11.67	8.99	6.84	5.42	4.44	0.00						
22	0.22	0.53	1.03	2.01	2.77	3.90	5.76	9.41	12.99	16.54	21.80	20.73	15.77	12.52	9.64	7.33	5.82	4.76	0.00						
23	0.23	0.55	1.08	2.10	2.90	4.08	6.02	9.83	13.58	17.29	22.79	22.16	16.86	13.38	10.30	7.84	6.22	5.09	0.00						
24	0.24	0.58	1.13	2.19	3.02	4.26	6.28	10.26	14.18	18.04	23.78	23.62	17.97	14.26	10.98	8.35	6.63	1.36	0.00						
25	0.25	0.60	1.17	2.28	3.15	4.44	6.55	10.69	14.77	18.79	24.77	25.11	19.11	15.16	11.67	8.88	7.05	0.00							
26	0.26	0.63	1.22	2.37	3.28	4.61	6.81	11.12	15.36	19.55	25.76	26.64	20.26	16.08	12.38	9.42	7.47	0.00							
28	0.28	0.67	1.31	2.55	3.53	4.97	7.33	11.97	16.54	21.05	27.75	29.77	22.65	17.97	13.84	10.52	4.74	0.00							
30	0.30	0.72	1.41	2.74	3.78	5.32	7.86	12.83	17.72	22.55	29.73	33.01	25.11	19.93	15.34	11.67	0.00								
32	0.32	0.77	1.50	2.92	4.03	5.68	8.38	13.68	18.90	24.06	31.71	36.37	27.67	21.96	16.90	12.86	0.00								
35	0.35	0.84	1.64	3.19	4.41	6.21	9.16	14.97	20.67	26.31	34.68	41.60	31.65	25.11	19.34	0.94	0.00								
40	0.40	0.96	1.88	3.65	5.04	7.10	10.47	17.10	23.63	30.07	39.64	49.11	38.67	30.68	23.62	0.00									
45	0.45	1.08	2.11	4.10	5.67	7.98	11.78	19.24	26.58	33.83	44.59	55.24	46.14	36.61	8.64	0.00									
	Type A [Note (1)]				Type B [Note (2)]						Type C [Note (3)]														

NOTES:
(1) Type A: Manual or drip lubrication
(2) Type B: Bath or disc lubrication
(3) Type C: Oil stream lubrication

Table A-9 Horsepower Ratings, Single Strand Roller Chain No. 60 (0.750 in. Pitch)

No. of Teeth	Speed, Revolutions/min, Small Sprocket																								
	10	25	50	100	120	200	300	400	500	600	800	1,000	1,200	1,400	1,600	1,800	2,000	2,500	3,000	3,500	4,000	4,500	5,000	5,500	6,000
11	0.19	0.46	0.89	1.72	2.05	3.35	4.95	6.52	8.08	9.63	12.69	15.58	11.85	9.41	7.70	6.45	5.51	3.94	3.00	2.38	1.95	1.63	1.39	1.21	0.00
12	0.21	0.50	0.97	1.88	2.24	3.66	5.40	7.12	8.82	10.51	13.85	17.15	13.51	10.72	8.77	7.35	6.28	4.49	3.42	2.71	2.22	1.86	1.59	1.38	0.00
13	0.22	0.54	1.05	2.04	2.43	3.96	5.85	7.71	9.55	11.38	15.00	18.58	15.23	12.08	9.89	8.29	7.08	5.06	3.85	3.06	2.50	2.10	1.79	0.00	
14	0.24	0.58	1.13	2.19	2.61	4.27	6.30	8.30	10.29	12.26	16.15	20.01	17.02	13.51	11.05	9.26	7.91	5.66	4.31	3.42	2.80	2.34	0.41	0.00	
15	0.26	0.62	1.21	2.35	2.80	4.57	6.75	8.90	11.02	13.13	17.31	21.44	18.87	14.98	12.26	10.27	8.77	6.28	4.77	3.79	3.10	2.60	0.00		
16	0.27	0.66	1.29	2.51	2.99	4.88	7.20	9.49	11.76	14.01	18.46	22.87	20.79	16.50	13.51	11.32	9.66	6.91	5.26	4.17	3.42	1.78	0.00		
17	0.29	0.70	1.37	2.66	3.17	5.18	7.65	10.08	12.49	14.88	19.62	24.30	22.77	18.07	14.79	12.40	10.58	7.57	5.76	4.57	3.74	0.00			
18	0.31	0.75	1.45	2.82	3.36	5.49	8.10	10.68	13.23	15.76	20.77	25.73	24.81	19.69	16.11	13.51	11.53	8.25	6.28	4.98	4.08	0.00			
19	0.33	0.79	1.53	2.98	3.55	5.79	8.55	11.27	13.96	16.63	21.92	27.16	26.91	21.35	17.48	14.65	12.50	8.95	6.81	5.40	0.20	0.00			
20	0.34	0.83	1.61	3.13	3.73	6.10	9.00	11.86	14.70	17.51	23.08	28.59	29.06	23.06	18.87	15.82	13.51	9.66	7.35	5.83	0.00				
21	0.36	0.87	1.69	3.29	3.92	6.40	9.45	12.46	15.43	18.38	24.23	30.02	31.26	24.81	20.31	17.02	14.53	10.40	7.91	6.28	0.00				
22	0.38	0.91	1.77	3.45	4.11	6.71	9.90	13.05	16.17	19.26	25.39	31.45	33.52	26.60	21.77	18.25	15.58	11.15	8.48	0.00					
23	0.40	0.95	1.85	3.61	4.29	7.01	10.35	13.64	16.90	20.13	26.54	32.88	35.84	28.44	23.28	19.51	16.66	11.92	9.07	0.00					
24	0.41	0.99	1.93	3.76	4.48	7.32	10.80	14.24	17.64	21.01	27.69	34.31	38.20	30.31	24.81	20.79	17.75	12.70	9.66	0.00					
25	0.43	1.04	2.01	3.92	4.67	7.62	11.25	14.83	18.37	21.89	28.85	35.74	40.61	32.23	26.38	22.11	18.87	13.51	10.27	0.00					
26	0.45	1.08	2.09	4.08	4.85	7.93	11.70	15.42	19.11	22.76	30.00	37.17	43.07	34.18	27.98	23.44	20.02	14.32	10.90	0.00					
28	0.48	1.16	2.26	4.39	5.23	8.54	12.60	16.61	20.58	24.51	32.31	40.03	47.68	38.20	31.26	26.20	22.37	16.01	0.00						
30	0.52	1.24	2.42	4.70	5.60	9.15	13.50	17.79	22.05	26.26	34.62	42.89	51.09	42.36	34.67	29.06	24.81	17.75	0.00						
32	0.55	1.33	2.58	5.02	5.98	9.76	14.40	18.98	23.52	28.01	36.92	45.75	54.50	46.67	38.20	32.01	27.33	19.56	0.00						
35	0.60	1.45	2.82	5.49	6.54	10.67	15.75	20.76	25.72	30.64	40.39	50.03	59.60	53.38	43.69	36.62	31.26	1.35	0.00						
40	0.69	1.66	3.22	6.27	7.47	12.20	18.00	23.73	29.39	35.02	46.16	57.18	68.12	65.22	53.38	44.74	38.20	0.00							
45	0.77	1.86	3.63	7.05	8.40	13.72	20.25	26.69	33.07	39.39	51.92	64.33	76.63	77.83	63.70	53.38	12.45	0.00							
	Type A [Note (1)]				Type B [Note (2)]							Type C [Note (3)]													

NOTES:

(1) Type A: Manual or drip lubrication

(2) Type B: Bath or disc lubrication

(3) Type C: Oil stream lubrication

Table A-10 Horsepower Ratings, Single Strand Roller Chain No. 60H (0.750 in. Pitch)

No. of Teeth	Speed, Revolutions/min, Small Sprocket																								
	10	25	50	90	100	200	300	400	500	600	800	1,000	1,200	1,400	1,600	1,800	2,000	2,500	3,000	3,500	4,000	4,500	5,000	5,500	6,000
11	0.22	0.53	1.02	1.80	1.99	3.87	5.72	7.53	9.33	11.12	14.66	15.58	11.85	9.41	7.70	6.45	5.51	3.94	3.00	2.38	1.95	1.63	1.39	1.21	0.00
12	0.24	0.57	1.12	1.96	2.17	4.23	6.24	8.22	10.18	12.13	15.99	17.75	13.51	10.72	8.77	7.35	6.28	4.49	3.42	2.71	2.22	1.86	1.59	0.00	
13	0.26	0.62	1.21	2.13	2.35	4.58	6.76	8.90	11.03	13.14	17.32	20.02	15.23	12.08	9.89	8.29	7.08	5.06	3.85	3.06	2.50	2.10	1.79	0.00	
14	0.28	0.67	1.30	2.29	2.53	4.93	7.27	9.59	11.88	14.15	18.65	22.37	17.02	13.51	11.05	9.26	7.91	5.66	4.31	3.42	2.80	2.34	0.00		
15	0.30	0.72	1.40	2.45	2.71	5.28	7.79	10.27	12.73	15.16	19.99	24.76	18.87	14.98	12.26	10.27	8.77	6.28	4.77	3.79	3.10	2.60	0.00		
16	0.32	0.77	1.49	2.62	2.90	5.63	8.31	10.96	13.58	16.17	21.32	26.41	20.79	16.50	13.51	11.32	9.66	6.91	5.26	4.17	3.42	0.00			
17	0.34	0.81	1.58	2.78	3.08	5.99	8.83	11.64	14.43	17.18	22.65	28.06	22.77	18.07	14.79	12.40	10.58	7.57	5.76	4.57	3.74	0.00			
18	0.36	0.86	1.67	2.94	3.26	6.34	9.35	12.33	15.27	18.20	23.98	29.71	24.81	19.69	16.11	13.51	11.53	8.25	6.28	4.98	1.06	0.00			
19	0.38	0.91	1.77	3.11	3.44	6.69	9.87	13.01	16.12	19.21	25.32	31.36	26.91	21.35	17.48	14.65	12.50	8.95	6.81	5.40	0.00				
20	0.40	0.96	1.86	3.27	3.62	7.04	10.39	13.70	16.97	20.22	26.65	33.01	29.06	23.06	18.87	15.82	13.51	9.66	7.35	5.83	0.00				
21	0.42	1.00	1.95	3.44	3.80	7.39	10.91	14.38	17.82	21.23	27.98	34.66	31.26	24.81	20.31	17.02	14.53	10.40	7.91	4.87	0.00				
22	0.44	1.05	2.05	3.60	3.98	7.75	11.43	15.07	18.67	22.24	29.31	36.32	33.52	26.60	21.77	18.25	15.58	11.15	8.48	0.00					
23	0.46	1.10	2.14	3.76	4.16	8.10	11.95	15.75	19.52	23.25	30.65	37.97	35.84	28.44	23.28	19.51	16.66	11.92	9.07	0.00					
24	0.48	1.15	2.23	3.93	4.34	8.45	12.47	16.44	20.37	24.26	31.98	39.62	38.20	30.31	24.81	20.79	17.75	12.70	9.66	0.00					
25	0.50	1.20	2.33	4.09	4.52	8.80	12.99	17.12	21.21	25.27	33.31	41.27	40.61	32.23	26.38	22.11	18.87	13.51	10.27	0.00					
26	0.52	1.24	2.42	4.25	4.71	9.15	13.51	17.81	22.06	26.28	34.64	42.92	43.07	34.18	27.98	23.44	20.02	14.32	4.17	0.00					
28	0.56	1.34	2.61	4.58	5.07	9.86	14.55	19.18	23.76	28.30	37.31	46.22	48.14	38.20	31.26	26.20	22.37	16.01	0.00						
30	0.60	1.43	2.79	4.91	5.43	10.56	15.59	20.55	25.46	30.33	39.97	49.52	53.38	42.36	34.67	29.06	24.81	17.75	0.00						
32	0.64	1.53	2.98	5.23	5.79	11.27	16.63	21.92	27.15	32.35	42.64	52.82	58.81	46.67	38.20	32.01	27.33	11.45	0.00						
35	0.69	1.67	3.26	5.73	6.33	12.32	18.19	23.97	29.70	35.38	46.63	57.77	67.27	53.38	43.69	36.62	31.26	0.00							
40	0.79	1.91	3.72	6.54	7.24	14.08	20.79	27.40	33.94	40.43	53.30	66.03	78.66	65.22	53.38	44.74	29.65	0.00							
45	0.89	2.15	4.19	7.36	8.14	15.84	23.38	30.82	38.18	45.49	59.96	74.28	88.49	77.83	63.70	37.00	0.00								
	Type A [Note (1)]			Type B [Note (2)]								Type C [Note (3)]													

NOTES:
(1) Type A: Manual or drip lubrication
(2) Type B: Bath or disc lubrication
(3) Type C: Oil stream lubrication

Table A-11 Horsepower Ratings, Single Strand Roller Chain No. 80 (1.000 in. Pitch)

No. of Teeth	Speed, Revolutions/min, Small Sprocket																								
	10	25	50	75	88	100	200	300	400	500	600	700	800	900	1,000	1,200	1,400	1,600	1,800	2,000	2,500	3,000	3,500	4,000	4,500
11	0.44	1.06	2.07	3.05	3.56	4.03	7.83	11.56	15.23	18.87	22.48	26.07	27.41	22.97	19.61	14.92	11.84	9.69	8.12	6.93	4.96	3.77	3.00	2.45	0.00
12	0.48	1.16	2.26	3.33	3.88	4.39	8.54	12.61	16.62	20.59	24.53	28.44	31.23	26.17	22.35	17.00	13.49	11.04	9.25	7.90	5.65	4.30	3.41	2.79	0.00
13	0.52	1.26	2.45	3.61	4.21	4.76	9.26	13.66	18.00	22.31	26.57	30.81	35.02	29.51	25.20	19.17	15.21	12.45	10.43	8.91	6.37	4.85	3.85	3.15	0.00
14	0.56	1.35	2.63	3.89	4.53	5.12	9.97	14.71	19.39	24.02	28.62	33.18	37.72	32.98	28.16	21.42	17.00	13.91	11.66	9.96	7.12	5.42	4.30	3.52	0.00
15	0.60	1.45	2.82	4.16	4.86	5.49	10.68	15.76	20.77	25.74	30.66	35.55	40.41	36.58	31.23	23.76	18.85	15.43	12.93	11.04	7.90	6.01	4.77	0.00	
16	0.64	1.55	3.01	4.44	5.18	5.86	11.39	16.81	22.16	27.45	32.70	37.92	43.11	40.30	34.41	26.17	20.77	17.00	14.25	12.16	8.70	6.62	5.25	0.00	
17	0.68	1.64	3.20	4.72	5.50	6.22	12.10	17.86	23.54	29.17	34.75	40.29	45.80	44.13	37.68	28.66	22.75	18.62	15.60	13.32	9.53	7.25	0.00		
18	0.72	1.74	3.39	5.00	5.83	6.59	12.81	18.91	24.93	30.88	36.79	42.66	48.49	48.08	41.05	31.23	24.78	20.29	17.00	14.51	10.39	7.90	0.00		
19	0.76	1.84	3.57	5.28	6.15	6.95	13.53	19.96	26.31	32.60	38.84	45.03	51.19	52.15	44.52	33.87	26.88	22.00	18.44	15.74	11.26	0.36	0.00		
20	0.80	1.93	3.76	5.55	6.47	7.32	14.24	21.01	27.70	34.32	40.88	47.40	53.88	56.32	48.08	36.58	29.03	23.76	19.91	17.00	12.16	0.00			
21	0.84	2.03	3.95	5.83	6.80	7.69	14.95	22.07	29.08	36.03	42.92	49.77	56.58	60.59	51.73	39.36	31.23	25.56	21.42	18.29	13.09	0.00			
22	0.88	2.13	4.14	6.11	7.12	8.05	15.66	23.12	30.47	37.75	44.97	52.14	59.27	64.97	55.47	42.20	33.49	27.41	22.97	19.61	14.03	0.00			
23	0.92	2.22	4.33	6.39	7.45	8.42	16.37	24.17	31.85	39.46	47.01	54.51	61.97	69.38	59.30	45.11	35.80	29.30	24.55	20.97	15.00	0.00			
24	0.96	2.32	4.52	6.66	7.77	8.78	17.09	25.22	33.24	41.18	49.06	56.88	64.66	72.40	63.21	48.08	38.16	31.23	26.17	22.35	15.99	0.00			
25	1.00	2.42	4.70	6.94	8.09	9.15	17.80	26.27	34.62	42.89	51.10	59.25	67.35	75.42	67.20	51.12	40.57	33.20	27.83	23.76	8.16	0.00			
26	1.04	2.51	4.89	7.22	8.42	9.52	18.51	27.32	36.01	44.61	53.14	61.62	70.05	78.43	71.27	54.22	43.02	35.22	29.51	25.20	0.00				
28	1.12	2.71	5.27	7.77	9.06	10.25	19.93	29.42	38.78	48.04	57.23	66.36	75.44	84.47	79.65	60.59	48.08	39.36	32.98	28.16	0.00				
30	1.20	2.90	5.64	8.33	9.71	10.98	21.36	31.52	41.55	51.47	61.32	71.10	80.82	90.50	88.33	67.20	53.33	43.65	36.58	31.23	0.00				
32	1.28	3.09	6.02	8.89	10.36	11.71	22.78	33.62	44.32	54.91	65.41	75.84	86.21	96.53	97.31	74.03	58.75	48.08	40.30	5.65	0.00				
35	1.40	3.38	6.58	9.72	11.33	12.81	24.92	36.78	48.47	60.05	71.54	82.95	94.29	105.58	111.31	84.68	67.20	55.00	28.15	0.00					
40	1.61	3.87	7.53	11.11	12.95	14.64	28.48	42.03	55.40	68.63	81.76	94.80	107.77	120.67	133.51	103.46	82.10	40.16	0.00						
45	1.81	4.35	8.47	12.49	14.57	16.47	32.04	47.28	62.32	77.21	91.98	106.65	121.24	135.75	150.20	123.45	72.28	0.00							
	Type A [Note (1)]				Type B [Note (2)]								Type C [Note (3)]												

NOTES:
(1) Type A: Manual or drip lubrication
(2) Type B: Bath or disc lubrication
(3) Type C: Oil stream lubrication

Table A-12 Horsepower Ratings, Single Strand Roller Chain No. 80H (1.000 in. Pitch)

No. of Teeth	Speed, Revolutions/min, Small Sprocket																								
	10	25	50	70	100	200	300	400	500	600	700	800	900	1,000	1,100	1,200	1,400	1,600	1,800	2,000	2,500	3,000	3,500	4,000	4,500
11	0.49	1.19	2.31	3.19	4.50	8.75	12.91	17.02	21.08	25.12	29.12	27.41	22.97	19.61	17.00	14.92	11.84	9.69	8.12	6.93	4.96	3.77	3.00	2.45	0.00
12	0.54	1.30	2.52	3.48	4.91	9.54	14.09	18.57	23.00	27.40	31.77	31.23	26.17	22.35	19.37	17.00	13.49	11.04	9.25	7.90	5.65	4.30	3.41	2.79	0.00
13	0.58	1.40	2.73	3.77	5.31	10.34	15.26	20.11	24.92	29.68	34.42	35.22	29.51	25.20	21.84	19.17	15.21	12.45	10.43	8.91	6.37	4.85	3.85	3.15	0.00
14	0.63	1.51	2.94	4.06	5.72	11.13	16.43	21.66	26.83	31.97	37.07	39.36	32.98	28.16	24.41	21.42	17.00	13.91	11.66	9.96	7.12	5.42	4.30	2.02	0.00
15	0.67	1.62	3.15	4.35	6.13	11.93	17.61	23.21	28.75	34.25	39.71	43.65	36.58	31.23	27.07	23.76	18.85	15.43	12.93	11.04	7.90	6.01	4.77	0.00	
16	0.72	1.73	3.36	4.64	6.54	12.73	18.78	24.75	30.67	36.53	42.36	48.08	40.30	34.41	29.82	26.17	20.77	17.00	14.25	12.16	8.70	6.62	0.00		
17	0.76	1.84	3.57	4.94	6.95	13.52	19.95	26.30	32.59	38.82	45.01	51.17	44.13	37.68	32.66	28.66	22.75	18.62	15.60	13.32	9.53	7.25	0.00		
18	0.81	1.94	3.78	5.23	7.36	14.32	21.13	27.85	34.50	41.10	47.66	54.17	48.08	41.05	35.59	31.23	24.78	20.29	17.00	14.51	10.39	1.88	0.00		
19	0.85	2.05	3.99	5.52	7.77	15.11	22.30	29.40	36.42	43.38	50.30	57.18	52.15	44.52	38.59	33.87	26.88	22.00	18.44	15.74	11.26	0.00			
20	0.90	2.16	4.20	5.81	8.18	15.91	23.48	30.94	38.34	45.67	52.95	60.19	56.32	48.08	41.68	36.58	29.03	23.76	19.91	17.00	12.16	0.00			
21	0.94	2.27	4.41	6.10	8.59	16.70	24.65	32.49	40.25	47.95	55.60	63.20	60.59	51.73	44.84	39.36	31.23	25.56	21.42	18.29	0.00				
22	0.99	2.38	4.62	6.39	8.99	17.50	25.82	34.04	42.17	50.24	58.25	66.21	64.97	55.47	48.08	42.20	33.49	27.41	22.97	19.61	0.00				
23	1.03	2.48	4.83	6.68	9.40	18.29	27.00	35.58	44.09	52.52	60.89	69.22	69.45	59.30	51.40	45.11	35.80	29.30	24.55	20.97	0.00				
24	1.08	2.59	5.04	6.97	9.81	19.09	28.17	37.13	46.00	54.80	63.54	72.23	74.03	63.21	54.79	48.08	38.16	31.23	26.17	22.35	0.00				
25	1.12	2.70	5.25	7.26	10.22	19.88	29.35	38.68	47.92	57.09	66.19	75.24	78.70	67.20	58.25	51.12	40.57	33.20	27.83	23.76	0.00				
26	1.17	2.81	5.46	7.55	10.63	20.68	30.52	40.23	49.84	59.37	68.84	78.25	83.47	71.27	61.78	54.22	43.02	35.22	29.51	25.20	0.00				
28	1.26	3.03	5.88	8.13	11.45	22.27	32.87	43.32	53.67	63.94	74.13	84.27	93.29	79.65	69.04	60.59	48.08	39.36	32.98	28.16	0.00				
30	1.34	3.24	6.31	8.71	12.27	23.86	35.21	46.41	57.50	68.50	79.43	90.29	101.10	88.33	76.57	67.20	53.33	43.65	36.58	12.26	0.00				
32	1.43	3.46	6.73	9.29	13.08	25.45	37.56	49.51	61.34	73.07	84.72	96.31	107.84	97.31	84.35	74.03	58.75	48.08	39.43	0.00					
35	1.57	3.78	7.36	10.16	14.31	27.84	41.08	54.15	67.09	79.92	92.67	105.34	117.95	111.31	96.49	84.68	67.20	55.00	5.58	0.00					
40	1.79	4.32	8.41	11.61	16.35	31.81	46.95	61.89	76.67	91.34	105.90	120.39	134.80	136.00	117.88	103.46	82.10	14.36	0.00						
45	2.02	4.86	9.46	13.06	18.40	35.79	52.82	69.62	86.25	102.75	119.14	135.44	151.65	162.28	140.66	123.45	43.25	0.00							
	Type A [Note (1)]			Type B [Note (2)]							Type C [Note (3)]														

NOTES:
(1) Type A: Manual or drip lubrication
(2) Type B: Bath or disc lubrication
(3) Type C: Oil stream lubrication

Table A-13 Horsepower Ratings, Single Strand Roller Chain No. 100 (1.250 in. Pitch)

No. of Teeth	Speed, Revolutions/min, Small Sprocket																									
	10	25	50	71	100	150	200	300	400	500	600	700	800	900	1,000	1,100	1,200	1,400	1,600	1,800	2,000	2,500	3,000	3,500	4,000
11	0.85	2.04	3.96	5.55	7.71	11.38	15.00	22.14	29.18	36.15	43.06	40.03	32.77	27.46	23.45	20.32	17.84	14.15	11.58	9.71	8.29	5.93	4.51	3.58	0.00
12	0.92	2.22	4.32	6.05	8.41	12.41	16.36	24.15	31.83	39.44	46.98	45.61	37.33	31.29	26.71	23.16	20.32	16.13	13.20	11.06	9.45	6.76	5.14	0.00	
13	1.00	2.41	4.68	6.56	9.11	13.45	17.73	26.16	34.48	42.72	50.89	51.43	42.10	35.28	30.12	26.11	22.92	18.18	14.88	12.47	10.65	7.62	5.80	0.00	
14	1.08	2.59	5.04	7.06	9.81	14.48	19.09	28.18	37.14	46.01	54.81	57.48	47.05	39.43	33.66	29.18	25.61	20.32	16.63	13.94	11.90	8.52	1.13	0.00	
15	1.15	2.78	5.41	7.57	10.51	15.52	20.45	30.19	39.79	49.30	58.72	63.75	52.18	43.73	37.33	32.36	28.40	22.54	18.45	15.46	13.20	9.45	0.00		
16	1.23	2.96	5.77	8.07	11.22	16.55	21.82	32.20	42.44	52.58	62.64	70.23	57.48	48.17	41.13	35.65	31.29	24.83	20.32	17.03	14.54	10.41	0.00		
17	1.31	3.15	6.13	8.58	11.92	17.59	23.18	34.21	45.10	55.87	66.55	76.91	62.95	52.76	45.05	39.04	34.27	27.19	22.26	18.65	15.93	11.40	0.00		
18	1.38	3.33	6.49	9.08	12.62	18.62	24.55	36.23	47.75	59.15	70.47	81.71	68.59	57.48	49.08	42.54	37.33	29.63	24.25	20.32	17.35	0.18	0.00		
19	1.46	3.52	6.85	9.59	13.32	19.66	25.91	38.24	50.40	62.44	74.38	86.25	74.38	62.34	53.22	46.13	40.49	32.13	26.30	22.04	18.82	0.00			
20	1.54	3.70	7.21	10.09	14.02	20.69	27.27	40.25	53.05	65.73	78.30	90.79	80.33	67.32	57.48	49.82	43.73	34.70	28.40	23.80	20.32	0.00			
21	1.61	3.89	7.57	10.60	14.72	21.73	28.64	42.26	55.71	69.01	82.21	95.33	86.43	72.43	61.85	53.61	47.05	37.33	30.56	25.61	21.87	0.00			
22	1.69	4.08	7.93	11.10	15.42	22.76	30.00	44.28	58.36	72.30	86.13	99.87	92.68	77.67	66.31	57.48	50.45	40.03	32.77	27.46	23.45	0.00			
23	1.77	4.26	8.29	11.60	16.12	23.79	31.36	46.29	61.01	75.59	90.04	104.41	99.07	83.02	70.89	61.44	53.93	42.79	35.03	29.35	25.06	0.00			
24	1.84	4.45	8.65	12.11	16.82	24.83	32.73	48.30	63.66	78.87	93.96	108.95	105.60	88.50	75.56	65.49	57.48	45.61	37.33	31.29	5.43	0.00			
25	1.92	4.63	9.01	12.61	17.52	25.86	34.09	50.31	66.32	82.16	97.87	113.48	112.27	94.09	80.33	69.63	61.11	48.49	39.69	33.26	0.00				
26	2.00	4.82	9.37	13.12	18.23	26.90	35.45	52.33	68.97	85.45	101.79	118.02	119.07	99.79	85.20	73.85	64.81	51.43	42.10	35.28	0.00				
28	2.15	5.19	10.09	14.13	19.63	28.97	38.18	56.35	74.27	92.02	109.62	127.10	133.07	111.52	95.22	82.53	72.43	57.48	47.05	0.00					
30	2.31	5.56	10.81	15.14	21.03	31.04	40.91	60.38	79.58	98.59	117.45	136.18	147.58	123.68	105.60	91.53	80.33	63.75	49.40	0.00					
32	2.46	5.93	11.53	16.15	22.43	33.11	43.64	64.40	84.88	105.16	125.28	145.26	162.58	136.25	116.33	100.84	88.50	70.23	8.82	0.00					
35	2.69	6.48	12.61	17.66	24.53	36.21	47.73	70.44	92.84	115.02	137.02	158.88	180.61	155.85	133.07	115.34	101.23	69.02	0.00						
40	3.07	7.41	14.41	20.18	28.04	41.38	54.54	80.50	106.11	131.45	156.60	181.58	206.41	190.42	162.58	140.92	122.68	0.00							
45	3.46	8.34	16.22	22.71	31.54	46.55	61.36	90.56	119.37	147.89	176.17	204.27	232.21	227.21	194.00	168.15	34.58	0.00							
	Type A [Note (1)]			Type B [Note (2)]							Type C [Note (3)]														

NOTES:
(1) Type A: Manual or drip lubrication
(2) Type B: Bath or disc lubrication
(3) Type C: Oil stream lubrication

Table A-14 Horsepower Ratings, Single Strand Roller Chain No. 100H (1.250 in. Pitch)

No. of Teeth	Speed, Revolutions/min, Small Sprocket																								
	10	25	50	58	100	200	300	400	500	600	700	800	900	1,000	1,100	1,200	1,400	1,600	1,800	2,000	2,200	2,400	2,700	3,000	3,500
11	0.93	2.23	4.34	5.01	8.45	16.43	24.25	31.96	39.60	47.18	40.03	32.77	27.46	23.45	20.32	17.84	14.15	11.58	9.71	8.29	7.19	6.31	5.28	4.51	0.00
12	1.01	2.44	4.74	5.46	9.21	17.93	26.46	34.87	43.20	51.46	45.61	37.33	31.29	26.71	23.16	20.32	16.13	13.20	11.06	9.45	8.19	7.19	6.02	5.14	0.00
13	1.09	2.64	5.13	5.92	9.98	19.42	28.66	37.78	46.80	55.75	51.43	42.10	35.28	30.12	26.11	22.92	18.18	14.88	12.47	10.65	9.23	8.10	6.79	5.80	0.00
14	1.18	2.84	5.53	6.37	10.75	20.91	30.86	40.68	50.40	60.04	57.48	47.05	39.43	33.66	29.18	25.61	20.32	16.63	13.94	11.90	10.32	9.05	7.59	0.00	
15	1.26	3.04	5.92	6.83	11.52	22.41	33.07	43.59	54.00	64.33	63.75	52.18	43.73	37.33	32.36	28.40	22.54	18.45	15.46	13.20	11.44	10.04	8.42	0.00	
16	1.35	3.25	6.32	7.28	12.29	23.90	35.27	46.49	57.60	68.62	70.23	57.48	48.17	41.13	35.65	31.29	24.83	20.32	17.03	14.54	12.60	11.06	0.00		
17	1.43	3.45	6.71	7.74	13.05	25.39	37.48	49.40	61.20	72.91	76.91	62.95	52.76	45.05	39.04	34.27	27.19	22.26	18.65	15.93	13.80	12.12	0.00		
18	1.52	3.65	7.11	8.19	13.82	26.89	39.68	52.31	64.80	77.20	83.80	68.59	57.48	49.08	42.54	37.33	29.63	24.25	20.32	17.35	15.04	2.94	0.00		
19	1.60	3.86	7.50	8.65	14.59	28.38	41.89	55.21	68.40	81.48	90.88	74.38	62.34	53.22	46.13	40.49	32.13	26.30	22.04	18.82	16.31	0.00			
20	1.68	4.06	7.89	9.10	15.36	29.88	44.09	58.12	72.00	85.77	98.15	80.33	67.32	57.48	49.82	43.73	34.70	28.40	23.80	20.32	7.77	0.00			
21	1.77	4.26	8.29	9.56	16.13	31.37	46.30	61.02	75.60	90.06	104.43	86.43	72.43	61.85	53.61	47.05	37.33	30.56	25.61	21.87	0.00				
22	1.85	4.46	8.68	10.01	16.89	32.86	48.50	63.93	79.20	94.35	109.40	92.68	77.67	66.31	57.48	50.45	40.03	32.77	27.46	21.67	0.00				
23	1.94	4.67	9.08	10.47	17.66	34.36	50.71	66.83	82.80	98.64	114.37	99.07	83.02	70.89	61.44	53.93	42.79	35.03	29.35	2.94	0.00				
24	2.02	4.87	9.47	10.92	18.43	35.85	52.91	69.74	86.40	102.93	119.34	105.60	88.50	75.56	65.49	57.48	45.61	37.33	31.29	0.00					
25	2.10	5.07	9.87	11.38	19.20	37.34	55.12	72.65	90.00	107.22	124.32	112.27	94.09	80.33	69.63	61.11	48.49	39.69	29.68	0.00					
26	2.19	5.28	10.26	11.83	19.97	38.84	57.32	75.55	93.60	111.51	129.29	119.07	99.79	85.20	73.85	64.81	51.43	42.10	11.58	0.00					
28	2.36	5.68	11.05	12.75	21.50	41.83	61.73	81.36	100.80	120.08	139.24	133.07	111.52	95.22	82.53	72.43	57.48	47.05	0.00						
30	2.53	6.09	11.84	13.66	23.04	44.81	66.14	87.18	108.00	128.66	149.18	147.58	123.68	105.60	91.53	80.33	63.75	19.16	0.00						
32	2.69	6.49	12.63	14.57	24.57	47.80	70.55	92.99	115.20	137.24	159.13	162.58	136.25	116.33	100.84	88.50	70.23	0.00							
35	2.95	7.10	13.82	15.93	26.88	52.28	77.16	101.71	126.00	150.10	174.04	185.97	155.85	133.07	115.34	101.23	33.74	0.00							
40	3.37	8.12	15.79	18.21	30.72	59.75	88.18	116.23	144.00	171.55	198.91	226.11	190.42	162.58	140.92	82.37	0.00								
45	3.79	9.13	17.76	20.48	34.55	67.22	99.21	130.76	162.00	192.99	223.77	254.38	227.21	194.00	85.51	0.00									
	Type A [Note (1)]			Type B [Note (2)]						Type C [Note (3)]															

NOTES:
(1) Type A: Manual or drip lubrication
(2) Type B: Bath or disc lubrication
(3) Type C: Oil stream lubrication

Table A-15 Horsepower Ratings, Single Strand Roller Chain No. 120 (1.500 in. Pitch)

No. of Teeth	Speed, Revolutions/min, Small Sprocket																									
	10	25	50	60	75	100	150	200	300	400	500	600	700	800	900	1,000	1,200	1,400	1,600	1,800	2,000	2,200	2,400	2,700	3,000
11	1.43	3.44	6.69	7.97	9.88	13.02	19.22	25.33	37.38	49.27	61.04	58.37	46.32	37.91	31.77	27.13	20.64	16.38	13.40	11.23	9.59	8.31	7.30	6.11	0.00
12	1.56	3.75	7.30	8.70	10.78	14.20	20.96	27.63	40.78	53.75	66.59	66.51	52.78	43.20	36.20	30.91	23.51	18.66	15.27	12.80	10.93	9.47	8.31	6.97	0.00
13	1.69	4.07	7.91	9.42	11.67	15.39	22.71	29.93	44.18	58.23	72.14	74.99	59.51	48.71	40.82	34.85	26.51	21.04	17.22	14.43	12.32	10.68	9.37	0.00	
14	1.82	4.38	8.52	10.15	12.57	16.57	24.46	32.24	47.58	62.71	77.69	83.81	66.51	54.44	45.62	38.95	29.63	23.51	19.25	16.13	13.77	11.94	10.48	0.00	
15	1.95	4.69	9.13	10.87	13.47	17.76	26.20	34.54	50.98	67.19	83.24	92.95	73.76	60.37	50.59	43.20	32.86	26.08	21.34	17.89	15.27	13.24	0.00		
16	2.08	5.00	9.74	11.60	14.37	18.94	27.95	36.84	54.37	71.67	88.79	102.39	81.26	66.51	55.74	47.59	36.20	28.73	23.51	19.71	16.83	14.58	0.00		
17	2.21	5.32	10.34	12.32	15.27	20.12	29.70	39.14	57.77	76.15	94.34	112.14	88.99	72.84	61.04	52.12	39.65	31.46	25.75	21.58	18.43	0.00			
18	2.34	5.63	10.95	13.05	16.16	21.31	31.45	41.45	61.17	80.63	99.89	119.00	96.96	79.36	66.51	56.78	43.20	34.28	28.06	23.51	20.08	0.00			
19	2.47	5.94	11.56	13.77	17.06	22.49	33.19	43.75	64.57	85.11	105.44	125.61	105.15	86.06	72.13	61.58	46.85	37.18	30.43	25.50	0.80	0.00			
20	2.60	6.26	12.17	14.50	17.96	23.67	34.94	46.05	67.97	89.59	110.99	132.22	113.56	92.95	77.89	66.51	50.59	40.15	32.86	27.54	0.00				
21	2.73	6.57	12.78	15.22	18.86	24.86	36.69	48.36	71.37	94.07	116.54	138.83	122.18	100.00	83.81	71.56	54.44	43.20	35.36	27.46	0.00				
22	2.86	6.88	13.39	15.95	19.76	26.04	38.43	50.66	74.76	98.55	122.09	145.44	131.01	107.23	89.87	76.73	58.37	46.32	37.91	0.00					
23	2.99	7.19	14.00	16.67	20.65	27.22	40.18	52.96	78.16	103.02	127.64	152.05	140.04	114.62	96.06	82.02	62.39	49.51	40.53	0.00					
24	3.11	7.51	14.60	17.40	21.55	28.41	41.93	55.26	81.56	107.50	133.19	158.66	149.28	122.18	102.39	87.43	66.51	52.78	43.20	0.00					
25	3.24	7.82	15.21	18.12	22.45	29.59	43.67	57.57	84.96	111.98	138.74	165.27	158.70	129.90	108.86	92.95	70.71	56.11	18.37	0.00					
26	3.37	8.13	15.82	18.85	23.35	30.78	45.42	59.87	88.36	116.46	144.29	171.88	168.32	137.77	115.46	98.58	74.99	59.51	0.00						
28	3.63	8.76	17.04	20.30	25.15	33.14	48.92	64.47	95.15	125.42	155.38	185.11	188.11	153.97	129.03	110.17	83.81	66.51	0.00						
30	3.89	9.38	18.25	21.75	26.94	35.51	52.41	69.08	101.95	134.38	166.48	198.33	208.62	170.75	143.10	122.18	92.95	13.70	0.00						
32	4.15	10.01	19.47	23.20	28.74	37.88	55.90	73.68	108.75	143.34	177.58	211.55	229.83	188.11	157.65	134.60	102.39	0.00							
35	4.54	10.95	21.30	25.37	31.43	41.43	61.14	80.59	118.94	156.78	194.23	231.38	262.89	215.17	180.33	153.97	117.13	0.00							
40	5.19	12.51	24.34	28.99	35.92	47.35	69.88	92.11	135.94	179.17	221.98	264.44	306.61	262.89	220.32	176.66	0.00								
45	5.84	14.08	27.38	32.62	40.41	53.27	78.61	103.62	152.93	201.57	249.72	297.49	344.94	313.69	213.33	49.79	0.00								
	Type A [Note (1)]			Type B [Note (2)]								Type C [Note (3)]													

NOTES:
(1) Type A: Manual or drip lubrication
(2) Type B: Bath or disc lubrication
(3) Type C: Oil stream lubrication

Table A-16 Horsepower Ratings, Single Strand Roller Chain No. 120H (1.500 in. Pitch)

No. of Teeth	Speed, Revolutions/min, Small Sprocket																								
	5	10	25	50	75	100	150	200	300	400	500	600	700	800	900	1,000	1,200	1,400	1,600	1,800	2,000	2,200	2,400	2,700	3,000
11	0.79	1.54	3.72	7.23	10.67	14.06	20.76	27.36	40.38	53.22	65.93	58.37	46.32	37.91	31.77	27.13	20.64	16.38	13.40	11.23	9.59	8.31	7.30	6.11	0.00
12	0.86	1.68	4.05	7.89	11.64	15.34	22.64	29.85	44.05	58.06	71.93	66.51	52.78	43.20	36.20	30.91	23.51	18.66	15.27	12.80	10.93	9.47	8.31	1.06	0.00
13	0.94	1.82	4.39	8.54	12.61	16.62	24.53	32.33	47.72	62.90	77.92	74.99	59.51	48.71	40.82	34.85	26.51	21.04	17.22	14.43	12.32	10.68	9.37	0.00	
14	1.01	1.96	4.73	9.20	13.58	17.90	26.42	34.82	51.39	67.73	83.92	83.81	66.51	54.44	45.62	38.95	29.63	23.51	19.25	16.13	13.77	11.94	4.55	0.00	
15	1.08	2.10	5.07	9.86	14.55	19.18	28.30	37.31	55.06	72.57	89.91	92.95	73.76	60.37	50.59	43.20	32.86	26.08	21.34	17.89	15.27	13.24	0.00		
16	1.15	2.24	5.41	10.52	15.52	20.46	30.19	39.79	58.73	77.41	95.90	102.39	81.26	66.51	55.74	47.59	36.20	28.73	23.51	19.71	16.83	0.00			
17	1.23	2.38	5.74	11.17	16.49	21.73	32.08	42.28	62.40	82.25	101.90	112.14	88.99	72.84	61.04	52.12	39.65	31.46	25.75	21.58	18.43	0.00			
18	1.30	2.52	6.08	11.83	17.46	23.01	33.96	44.77	66.07	87.09	107.89	122.18	96.96	79.36	66.51	56.78	43.20	34.28	28.06	23.51	4.23	0.00			
19	1.37	2.66	6.42	12.49	18.43	24.29	35.85	47.26	69.74	91.93	113.89	132.50	105.15	86.06	72.13	61.58	46.85	37.18	30.43	25.50	0.00				
20	1.44	2.80	6.76	13.14	19.40	25.57	37.74	49.74	73.41	96.76	119.88	142.81	113.56	92.95	77.89	66.51	50.59	40.15	32.86	24.58	0.00				
21	1.51	2.94	7.09	13.80	20.37	26.85	39.63	52.23	77.08	101.60	125.87	149.95	122.18	100.00	83.81	71.56	54.44	43.20	35.36	0.00					
22	1.59	3.08	7.43	14.46	21.34	28.13	41.51	54.72	80.75	106.44	131.87	157.09	131.01	107.23	89.87	76.73	58.37	46.32	37.91	0.00					
23	1.66	3.22	7.77	15.12	22.31	29.41	43.40	57.20	84.42	111.28	137.86	164.23	140.04	114.62	96.06	82.02	62.39	49.51	38.38	0.00					
24	1.73	3.36	8.11	15.77	23.28	30.68	45.29	59.69	88.10	116.12	143.86	171.37	149.28	122.18	102.39	87.43	66.51	52.78	12.24	0.00					
25	1.80	3.50	8.45	16.43	24.25	31.96	47.17	62.18	91.77	120.96	149.85	178.51	158.70	129.90	108.86	92.95	70.71	56.11	0.00						
26	1.87	3.64	8.78	17.09	25.22	33.24	49.06	64.66	95.44	125.79	155.84	185.65	168.32	137.77	115.46	98.58	74.99	59.51	0.00						
28	2.02	3.93	9.46	18.40	27.16	35.80	52.83	69.64	102.78	135.47	167.83	199.94	188.11	153.97	129.03	110.17	83.81	30.35	0.00						
30	2.16	4.21	10.14	19.72	29.10	38.36	56.61	74.61	110.12	145.15	179.82	214.22	208.62	170.75	143.10	122.18	92.95	0.00							
32	2.31	4.49	10.81	21.03	31.04	40.91	60.38	79.59	117.46	154.82	191.81	228.50	229.83	188.11	157.65	134.60	88.71	0.00							
35	2.52	4.91	11.82	23.00	33.95	44.75	66.04	87.05	128.47	169.34	209.79	249.92	262.89	215.17	180.33	153.97	12.54	0.00							
40	2.88	5.61	13.51	26.29	38.80	51.14	75.48	99.48	146.83	193.53	239.76	285.62	321.19	262.89	220.32	118.61	0.00								
45	3.24	6.31	15.20	29.58	43.65	57.53	84.91	111.92	165.18	217.72	269.73	321.32	372.57	278.98	148.03	0.00									
	Type A [Note (1)]			Type B [Note (2)]							Type C [Note (3)]														

NOTES:
(1) Type A: Manual or drip lubrication
(2) Type B: Bath or disc lubrication
(3) Type C: Oil stream lubrication

Table A-17 Horsepower Ratings, Single Strand Roller Chain No. 140 (1.750 in. Pitch)

No. of Teeth	Speed, Revolutions/min, Small Sprocket																								
	5	10	25	50	53	75	100	150	200	300	400	500	600	700	800	900	1,000	1,200	1,400	1,600	1,800	2,000	2,200	2,400	2,700
11	1.14	2.21	5.32	10.36	10.95	15.28	20.15	29.73	39.19	57.84	76.24	86.80	66.03	52.40	42.89	35.94	30.69	23.35	18.53	15.16	12.71	10.85	9.40	8.25	0.00
12	1.24	2.41	5.81	11.30	11.95	16.67	21.98	32.44	42.75	63.10	83.17	98.90	75.24	59.70	48.87	40.95	34.97	26.60	21.11	17.28	14.48	12.36	10.72	0.72	0.00
13	1.34	2.61	6.29	12.24	12.94	18.06	23.81	35.14	46.32	68.36	90.10	111.52	84.83	67.32	55.10	46.18	39.43	29.99	23.80	19.48	16.33	13.94	12.08	0.00	
14	1.45	2.81	6.78	13.18	13.94	19.45	25.64	37.84	49.88	73.61	97.03	120.21	94.81	75.24	61.58	51.61	44.06	33.52	26.60	21.77	18.25	15.58	0.00		
15	1.55	3.01	7.26	14.12	14.93	20.84	27.47	40.54	53.44	78.87	103.96	128.79	105.15	83.44	68.29	57.23	48.87	37.17	29.50	24.15	20.24	17.28	0.00		
16	1.65	3.21	7.74	15.06	15.93	22.23	29.30	43.25	57.00	84.13	110.89	137.38	115.83	91.92	75.24	63.05	53.83	40.95	32.50	26.60	22.29	0.00			
17	1.75	3.41	8.23	16.00	16.93	23.62	31.13	45.95	60.57	89.39	117.82	145.97	126.86	100.67	82.40	69.05	58.96	44.85	35.59	29.13	24.41	0.00			
18	1.86	3.61	8.71	16.95	17.92	25.01	32.97	48.65	64.13	94.65	124.75	154.55	138.22	109.68	89.77	75.24	64.24	48.87	38.78	31.74	0.00				
19	1.96	3.82	9.20	17.89	18.92	26.40	34.80	51.36	67.69	99.90	131.68	163.14	149.89	118.95	97.36	81.59	69.66	53.00	42.06	34.42	0.00				
20	2.06	4.02	9.68	18.83	19.91	27.79	36.63	54.06	71.25	105.16	138.61	171.73	161.88	128.46	105.15	88.12	75.24	57.23	45.42	35.82	0.00				
21	2.17	4.22	10.16	19.77	20.91	29.18	38.46	56.76	74.82	110.42	145.54	180.31	174.17	138.22	113.13	94.81	80.95	61.58	48.87	0.00					
22	2.27	4.42	10.65	20.71	21.90	30.57	40.29	59.47	78.38	115.68	152.47	188.90	186.76	148.21	121.30	101.66	86.80	66.03	52.40	0.00					
23	2.37	4.62	11.13	21.65	22.90	31.96	42.12	62.17	81.94	120.94	159.40	197.48	199.64	158.43	129.67	108.67	92.78	70.58	56.01	0.00					
24	2.48	4.82	11.62	22.60	23.90	33.35	43.95	64.87	85.51	126.20	166.33	206.07	212.80	168.87	138.22	115.83	98.90	75.24	37.90	0.00					
25	2.58	5.02	12.10	23.54	24.89	34.74	45.79	67.57	89.07	131.45	173.27	214.66	226.24	179.53	146.94	123.15	105.15	79.99	0.00						
26	2.68	5.22	12.58	24.48	25.89	36.13	47.62	70.28	92.63	136.71	180.20	223.24	239.95	190.41	155.85	130.61	111.52	84.83	0.00						
28	2.89	5.62	13.55	26.36	27.88	38.91	51.28	75.68	99.76	147.23	194.06	240.42	268.16	212.80	174.17	145.97	124.63	94.81	0.00						
30	3.10	6.02	14.52	28.24	29.87	41.68	54.94	81.09	106.88	157.74	207.92	257.59	297.40	236.00	193.16	161.88	138.22	18.64	0.00						
32	3.30	6.43	15.49	30.13	31.86	44.46	58.61	86.50	114.01	168.26	221.78	274.76	327.63	259.99	212.80	178.34	152.27	0.00							
35	3.61	7.03	16.94	32.95	34.85	48.63	64.10	94.60	124.70	184.03	242.57	300.52	358.00	297.40	243.41	203.99	135.27	0.00							
40	4.13	8.03	19.36	37.66	39.83	55.58	73.26	108.12	142.51	210.33	277.22	343.45	409.15	363.35	297.40	153.78	0.00								
45	4.65	9.04	21.78	42.37	44.80	62.53	82.42	121.63	160.32	236.62	311.88	386.38	460.29	433.56	221.34	0.00									
	Type A [Note (1)]				Type B [Note (2)]							Type C [Note (3)]													

NOTES:

(1) Type A: Manual or drip lubrication

(2) Type B: Bath or disc lubrication

(3) Type C: Oil stream lubrication

Table A-18 Horsepower Ratings, Single Strand Roller Chain No. 140H (1.750 in. Pitch)

No. of Teeth	Speed, Revolutions/min, Small Sprocket																								
	5	10	25	44	50	75	100	150	200	300	400	500	600	700	800	900	1,000	1,200	1,400	1,600	1,800	2,000	2,200	2,400	2,700
11	1.21	2.36	5.69	9.79	11.07	16.34	21.54	31.79	41.90	61.84	81.50	86.80	66.03	52.40	42.89	35.94	30.69	23.35	18.53	15.16	12.71	10.85	9.40	8.25	0.00
12	1.32	2.58	6.21	10.68	12.08	17.83	23.50	34.68	45.71	67.46	88.91	98.90	75.24	59.70	48.87	40.95	34.97	26.60	21.11	17.28	14.48	12.36	10.72	0.00	
13	1.43	2.79	6.73	11.57	13.08	19.31	25.45	37.57	49.52	73.08	96.32	111.52	84.83	67.32	55.10	46.18	39.43	29.99	23.80	19.48	16.33	13.94	0.00		
14	1.55	3.01	7.24	12.46	14.09	20.80	27.41	40.46	53.32	78.70	103.73	124.63	94.81	75.24	61.58	51.61	44.06	33.52	26.60	21.77	18.25	15.58	0.00		
15	1.66	3.22	7.76	13.35	15.10	22.28	29.37	43.35	57.13	84.32	111.14	137.69	105.15	83.44	68.29	57.23	48.87	37.17	29.50	24.15	20.24	0.00			
16	1.77	3.44	8.28	14.24	16.10	23.77	31.33	46.24	60.94	89.94	118.55	146.87	115.83	91.92	75.24	63.05	53.83	40.95	32.50	26.60	22.29	0.00			
17	1.88	3.65	8.80	15.13	17.11	25.25	33.29	49.13	64.75	95.56	125.96	156.05	126.86	100.67	82.40	69.05	58.96	44.85	35.59	29.13	0.00				
18	1.99	3.86	9.31	16.02	18.12	26.74	35.24	52.02	68.56	101.19	133.37	165.23	138.22	109.68	89.77	75.24	64.24	48.87	38.78	31.74	0.00				
19	2.10	4.08	9.83	16.92	19.12	28.22	37.20	54.90	72.37	106.81	140.78	174.41	149.89	118.95	97.36	81.59	69.66	53.00	42.06	33.55	0.00				
20	2.21	4.29	10.35	17.81	20.13	29.71	39.16	57.79	76.18	112.43	148.19	183.59	161.88	128.46	105.15	88.12	75.24	57.23	45.42	0.00					
21	2.32	4.51	10.87	18.70	21.14	31.20	41.12	60.68	79.99	118.05	155.60	192.77	174.17	138.22	113.13	94.81	80.95	61.58	48.87	0.00					
22	2.43	4.72	11.38	19.59	22.14	32.68	43.08	63.57	83.80	123.67	163.01	201.95	186.76	148.21	121.30	101.66	86.80	66.03	52.40	0.00					
23	2.54	4.94	11.90	20.48	23.15	34.17	45.03	66.46	87.60	129.29	170.42	211.13	199.64	158.43	129.67	108.67	92.78	70.58	29.48	0.00					
24	2.65	5.15	12.42	21.37	24.16	35.65	46.99	69.35	91.41	134.91	177.83	220.31	212.80	168.87	138.22	115.83	98.90	75.24	0.00						
25	2.76	5.37	12.94	22.26	25.16	37.14	48.95	72.24	95.22	140.54	185.24	229.49	226.24	179.53	146.94	123.15	105.15	79.99	0.00						
26	2.87	5.58	13.45	23.15	26.17	38.62	50.91	75.13	99.03	146.16	192.65	238.67	239.95	190.41	155.85	130.61	111.52	84.83	0.00						
28	3.09	6.01	14.49	24.93	28.18	41.59	54.82	80.91	106.65	157.40	207.47	257.03	268.16	212.80	174.17	145.97	124.63	41.32	0.00						
30	3.31	6.44	15.52	26.71	30.20	44.56	58.74	86.69	114.27	168.64	222.28	275.39	297.40	236.00	193.16	161.88	138.22	0.00							
32	3.53	6.87	16.56	28.49	32.21	47.54	62.66	92.47	121.88	179.89	237.10	293.74	327.63	259.99	212.80	178.34	152.27	0.00							
35	3.86	7.51	18.11	31.16	35.23	51.99	68.53	101.14	133.31	196.75	259.33	321.28	374.76	297.40	243.41	203.99	66.13	0.00							
40	4.41	8.59	20.70	35.61	40.26	59.42	78.32	115.59	152.36	224.86	296.38	367.18	437.42	363.35	264.26	74.76	0.00								
45	4.97	9.66	23.28	40.06	45.29	66.85	88.11	130.04	171.40	252.96	333.43	413.08	492.09	352.89	132.45	0.00									
	Type A [Note (1)]			Type B [Note (2)]							Type C [Note (3)]														

NOTES:
(1) Type A: Manual or drip lubrication
(2) Type B: Bath or disc lubrication
(3) Type C: Oil stream lubrication

Table A-19 Horsepower Ratings, Single Strand Roller Chain No. 160 (2.000 in. Pitch)

No. of Teeth	Speed, Revolutions/min, Small Sprocket																								
	5	10	25	47	50	75	100	150	200	300	400	500	600	700	800	900	1,000	1,100	1,200	1,400	1,600	1,800	2,000	2,200	2,400
11	1.65	3.20	7.72	14.16	15.02	22.17	29.23	43.14	56.86	83.91	110.60	96.58	73.47	58.31	47.72	39.99	34.15	29.60	25.98	20.61	16.87	14.14	12.07	10.46	0.00
12	1.80	3.50	8.43	15.45	16.39	24.19	31.88	47.06	62.03	91.54	120.66	110.05	83.72	66.44	54.38	45.57	38.91	33.73	29.60	23.49	19.22	16.11	13.76	0.00	
13	1.95	3.79	9.13	16.73	17.76	26.21	34.54	50.98	67.19	99.17	130.71	124.09	94.40	74.91	61.31	51.38	43.87	38.03	33.37	26.48	21.68	18.17	0.00		
14	2.10	4.08	9.83	18.02	19.12	28.22	37.20	54.90	72.36	106.80	140.77	138.68	105.50	83.72	68.52	57.43	49.03	42.50	37.30	29.60	24.23	20.30	0.00		
15	2.25	4.37	10.53	19.31	20.49	30.24	39.86	58.82	77.53	114.43	150.82	153.80	117.00	92.85	75.99	63.69	54.38	47.13	41.37	32.83	26.87	0.00			
16	2.40	4.66	11.23	20.59	21.85	32.25	42.51	62.74	82.70	122.05	160.88	169.43	128.89	102.28	83.72	70.16	59.90	51.92	45.57	36.16	29.60	0.00			
17	2.55	4.95	11.94	21.88	23.22	34.27	45.17	66.66	87.87	129.68	170.93	185.56	141.16	112.02	91.69	76.84	65.61	56.87	49.91	39.61	24.21	0.00			
18	2.70	5.24	12.64	23.17	24.59	36.29	47.83	70.59	93.04	137.31	180.99	202.17	153.80	122.05	99.90	83.72	71.48	61.96	54.38	43.15	0.00				
19	2.85	5.54	13.34	24.45	25.95	38.30	50.48	74.51	98.21	144.94	191.04	219.25	166.79	132.36	108.33	90.79	77.52	67.19	58.97	46.80	0.00				
20	3.00	5.83	14.04	25.74	27.32	40.32	53.14	78.43	103.38	152.57	201.10	236.79	180.13	142.95	117.00	98.05	83.72	72.57	63.69	46.79	0.00				
21	3.15	6.12	14.74	27.03	28.68	42.33	55.80	82.35	108.54	160.20	211.15	254.77	193.81	153.80	125.88	105.50	90.07	78.08	68.52	0.00					
22	3.29	6.41	15.45	28.32	30.05	44.35	58.45	86.27	113.71	167.83	221.21	273.18	207.82	164.91	134.98	113.12	96.58	83.72	73.47	0.00					
23	3.44	6.70	16.15	29.60	31.42	46.36	61.11	90.19	118.88	175.45	231.26	286.51	222.15	176.29	144.29	120.92	103.24	89.49	78.54	0.00					
24	3.59	6.99	16.85	30.89	32.78	48.38	63.77	94.11	124.05	183.08	241.32	298.97	236.79	187.91	153.80	128.89	110.05	95.39	83.72	0.00					
25	3.74	7.28	17.55	32.18	34.15	50.40	66.43	98.04	129.22	190.71	251.37	311.42	251.74	199.77	163.51	137.03	117.00	101.41	32.66	0.00					
26	3.89	7.57	18.26	33.46	35.51	52.41	69.08	101.96	134.39	198.34	261.43	323.88	267.00	211.88	173.42	145.33	124.09	107.56	0.00						
28	4.19	8.16	19.66	36.04	38.24	56.44	74.40	109.80	144.73	213.60	281.54	348.79	298.39	236.79	193.81	162.42	138.68	36.88	0.00						
30	4.49	8.74	21.06	38.61	40.98	60.48	79.71	117.64	155.06	228.85	301.65	373.71	330.92	262.61	214.94	180.13	126.46	0.00							
32	4.79	9.32	22.47	41.19	43.71	64.51	85.03	125.49	165.40	244.11	321.76	398.62	364.56	289.30	236.79	198.44	22.58	0.00							
35	5.24	10.20	24.57	45.05	47.81	70.55	93.00	137.25	180.91	266.99	351.92	435.99	417.01	330.92	270.86	112.60	0.00								
40	5.99	11.65	28.09	51.48	54.63	80.63	106.28	156.86	206.75	305.14	402.19	498.28	509.49	404.31	160.63	0.00									
45	6.74	13.11	31.60	57.92	61.46	90.71	119.57	176.47	232.59	343.28	452.47	560.56	607.95	289.10	0.00										
	Type A [Note (1)]			Type B [Note (2)]							Type C [Note (3)]														

NOTES:

(1) Type A: Manual or drip lubrication

(2) Type B: Bath or disc lubrication

(3) Type C: Oil stream lubrication

Table A-20 Horsepower Ratings, Single Strand Roller Chain No. 160H (2.000 in. Pitch)

No. of Teeth	Speed, Revolutions/min, Small Sprocket																								
	2	5	10	25	40	50	75	100	150	200	300	400	500	600	700	800	900	1,000	1,100	1,200	1,400	1,600	1,800	2,000	2,200
11	0.73	1.75	3.40	8.19	12.86	15.94	23.52	31.00	45.75	60.31	89.00	117.32	96.58	73.47	58.31	47.72	39.99	34.15	29.60	25.98	20.61	16.87	14.14	12.07	0.00
12	0.79	1.91	3.71	8.94	14.03	17.39	25.66	33.82	49.91	65.79	97.10	127.98	110.05	83.72	66.44	54.38	45.57	38.91	33.73	29.60	23.49	19.22	16.11	12.02	0.00
13	0.86	2.07	4.02	9.68	15.20	18.83	27.80	36.64	54.07	71.27	105.19	138.65	124.09	94.40	74.91	61.31	51.38	43.87	38.03	33.37	26.48	21.68	18.17	0.00	
14	0.92	2.22	4.33	10.43	16.37	20.28	29.93	39.46	58.23	76.75	113.28	149.31	138.68	105.50	83.72	68.52	57.43	49.03	42.50	37.30	29.60	24.23	8.08	0.00	
15	0.99	2.38	4.64	11.17	17.54	21.73	32.07	42.27	62.39	82.24	121.37	159.98	153.80	117.00	92.85	75.99	63.69	54.38	47.13	41.37	32.83	26.87	0.00		
16	1.05	2.54	4.94	11.92	18.71	23.18	34.21	45.09	66.55	87.72	129.46	170.64	169.43	128.89	102.28	83.72	70.16	59.90	51.92	45.57	36.16	29.60	0.00		
17	1.12	2.70	5.25	12.66	19.88	24.63	36.35	47.91	70.71	93.20	137.55	181.31	185.56	141.16	112.02	91.69	76.84	65.61	56.87	49.91	39.61	0.00			
18	1.19	2.86	5.56	13.41	21.05	26.08	38.49	50.73	74.87	98.68	145.64	191.97	202.17	153.80	122.05	99.90	83.72	71.48	61.96	54.38	43.15	0.00			
19	1.25	3.02	5.87	14.15	22.22	27.53	40.63	53.55	79.03	104.17	153.74	202.64	219.25	166.79	132.36	108.33	90.79	77.52	67.19	58.97	43.82	0.00			
20	1.32	3.18	6.18	14.89	23.39	28.98	42.76	56.37	83.19	109.65	161.83	213.30	236.79	180.13	142.95	117.00	98.05	83.72	72.57	63.69	0.00				
21	1.38	3.34	6.49	15.64	24.56	30.42	44.90	59.18	87.35	115.13	169.92	223.97	254.77	193.81	153.80	125.88	105.50	90.07	78.08	68.52	0.00				
22	1.45	3.49	6.80	16.38	25.73	31.87	47.04	62.00	91.51	120.61	178.01	234.63	273.18	207.82	164.91	134.98	113.12	96.58	83.72	73.47	0.00				
23	1.52	3.65	7.11	17.13	26.90	33.32	49.18	64.82	95.67	126.10	186.10	245.30	292.02	222.15	176.29	144.29	120.92	103.24	89.49	68.24	0.00				
24	1.58	3.81	7.42	17.87	28.07	34.77	51.32	67.64	99.83	131.58	194.19	255.96	311.27	236.79	187.91	153.80	128.89	110.05	95.39	21.76	0.00				
25	1.65	3.97	7.73	18.62	29.23	36.22	53.45	70.46	103.99	137.06	202.28	266.63	330.32	251.74	199.77	163.51	137.03	117.00	101.41	0.00					
26	1.71	4.13	8.03	19.36	30.40	37.67	55.59	73.28	108.14	142.54	210.37	277.29	343.53	267.00	211.88	173.42	145.33	124.09	67.09	0.00					
28	1.85	4.45	8.65	20.85	32.74	40.57	59.87	78.91	116.46	153.51	226.56	298.62	369.96	298.39	236.79	193.81	162.42	135.17	0.00						
30	1.98	4.77	9.27	22.34	35.08	43.46	64.15	84.55	124.78	164.47	242.74	319.95	396.38	330.92	262.61	214.94	180.13	49.06	0.00						
32	2.11	5.08	9.89	23.83	37.42	46.36	68.42	90.18	133.10	175.44	258.92	341.28	422.81	364.56	289.30	236.79	157.70	0.00							
35	2.31	5.56	10.82	26.07	40.93	50.71	74.84	98.64	145.58	191.88	283.20	373.28	462.45	417.01	330.92	270.86	22.30	0.00							
40	2.64	6.35	12.36	29.79	46.78	57.95	85.53	112.73	166.38	219.30	323.65	426.60	528.51	509.49	345.15	57.42	0.00								
45	2.97	7.15	13.91	33.51	52.62	65.19	96.22	126.82	187.17	246.71	364.11	479.93	594.58	495.96	173.00	0.00									
	Type A [Note (1)]				Type B [Note (2)]							Type C [Note (3)]													

NOTES:
(1) Type A: Manual or drip lubrication
(2) Type B: Bath or disc lubrication
(3) Type C: Oil stream lubrication

Table A-21 Horsepower Ratings, Single Strand Roller Chain No. 180 (2.250 in. Pitch)

No. of Teeth	Speed, Revolutions/min, Small Sprocket																								
	2	5	10	25	43	50	75	100	150	200	300	400	500	600	700	800	900	1,000	1,100	1,200	1,400	1,600	1,800	2,000
11	0.94	2.27	4.43	10.66	17.95	20.75	30.62	40.36	59.56	78.51	115.87	148.32	106.13	80.73	64.07	52.44	43.95	37.52	32.52	28.54	22.65	18.54	15.54	0.00
12	1.03	2.48	4.83	11.63	19.58	22.63	33.40	44.03	64.98	85.64	126.40	166.61	120.92	91.99	73.00	59.75	50.07	42.75	37.06	32.52	25.81	21.12	17.70	0.00
13	1.12	2.69	5.23	12.60	21.21	24.52	36.19	47.70	70.39	92.78	136.93	180.49	136.35	103.72	82.31	67.37	56.46	48.21	41.79	36.67	29.10	23.82	0.00	
14	1.20	2.90	5.63	13.57	22.84	26.40	38.97	51.36	75.81	99.92	147.47	194.37	152.38	115.92	91.99	75.29	63.10	53.87	46.70	40.98	32.52	26.62	0.00	
15	1.29	3.10	6.03	14.54	24.48	28.29	41.75	55.03	81.22	107.06	158.00	208.26	169.00	128.56	102.02	83.50	69.98	59.75	51.79	45.45	36.07	0.00		
16	1.37	3.31	6.44	15.51	26.11	30.18	44.54	58.70	86.64	114.19	168.53	222.14	186.17	141.63	112.39	91.99	77.09	65.82	57.05	50.07	39.74	0.00		
17	1.46	3.52	6.84	16.48	27.74	32.06	47.32	62.37	92.05	121.33	179.07	236.02	203.90	155.11	123.09	100.75	84.43	72.09	62.49	54.84	43.52	0.00		
18	1.54	3.72	7.24	17.45	29.37	33.95	50.10	66.04	97.47	128.47	189.60	249.91	222.15	169.00	134.11	109.77	91.99	78.54	68.08	59.75	0.00			
19	1.63	3.93	7.64	18.42	31.00	35.83	52.89	69.71	102.88	135.60	200.13	263.79	240.92	183.27	145.44	119.04	99.76	85.18	73.83	64.80	0.00			
20	1.72	4.14	8.05	19.39	32.64	37.72	55.67	73.38	108.30	142.74	210.67	277.68	260.19	197.93	157.07	128.56	107.74	91.99	79.74	69.98	0.00			
21	1.80	4.34	8.45	20.36	34.27	39.61	58.45	77.05	113.71	149.88	221.20	291.56	279.94	212.96	169.00	138.32	115.92	98.97	85.79	75.29	0.00			
22	1.89	4.55	8.85	21.33	35.90	41.49	61.24	80.71	119.12	157.02	231.73	305.44	300.17	228.35	181.21	148.32	124.30	106.13	91.99	0.00				
23	1.97	4.76	9.25	22.30	37.53	43.38	64.02	84.38	124.54	164.15	242.27	319.33	320.87	244.10	193.70	158.54	132.87	113.45	98.33	0.00				
24	2.06	4.96	9.65	23.27	39.16	45.26	66.80	88.05	129.95	171.29	252.80	333.21	342.02	260.19	206.47	169.00	141.63	120.92	40.34	0.00				
25	2.15	5.17	10.06	24.24	40.79	47.15	69.59	91.72	135.37	178.43	263.33	347.10	363.62	276.62	219.51	179.67	150.57	128.56	0.00					
26	2.23	5.38	10.46	25.21	42.43	49.04	72.37	95.39	140.78	185.56	273.87	360.98	385.66	293.38	232.81	190.55	159.69	122.43	0.00					
28	2.40	5.79	11.26	27.15	45.69	52.81	77.94	102.73	151.61	199.84	294.93	388.75	431.00	327.87	260.19	212.96	178.47	0.00						
30	2.57	6.20	12.07	29.09	48.95	56.58	83.50	110.07	162.44	214.11	316.00	416.51	477.99	363.62	288.56	236.18	128.92	0.00						
32	2.75	6.62	12.87	31.02	52.22	60.35	89.07	117.40	173.27	228.39	337.07	444.28	526.58	400.58	317.89	260.19	0.00							
35	3.00	7.24	14.08	33.93	57.11	66.01	97.42	128.41	189.52	249.80	368.67	485.93	602.34	458.22	363.62	142.51	0.00							
40	3.43	8.27	16.09	38.78	65.27	75.44	111.34	146.75	216.59	285.48	421.34	555.35	688.02	559.83	254.20	0.00								
45	3.86	9.31	18.10	43.63	73.43	84.87	125.26	165.10	243.66	321.17	474.00	624.77	774.03	480.00	0.00									
	Type A [Note (1)]				Type B [Note (2)]							Type C [Note (3)]												

NOTES:

(1) Type A: Manual or drip lubrication

(2) Type B: Bath or disc lubrication

(3) Type C: Oil stream lubrication

Table A-22 Horsepower Ratings, Single Strand Roller Chain No. 180H (2.250 in. Pitch)

No. of Teeth	Speed, Revolutions/min, Small Sprocket																							
	2	5	10	25	37	50	75	100	150	200	300	400	500	600	700	800	900	1,000	1,100	1,200	1,400	1,600	1,800	2,000
11	0.99	2.40	4.66	11.24	16.38	21.87	32.27	42.54	62.78	82.75	122.13	148.32	106.13	80.73	64.07	52.44	43.95	37.52	32.52	28.54	22.65	18.54	15.54	0.00
12	1.09	2.62	5.09	12.26	17.87	23.86	35.21	46.41	68.49	90.28	133.24	169.00	120.92	91.99	73.00	59.75	50.07	42.75	37.06	32.52	25.81	21.12	2.40	0.00
13	1.18	2.83	5.51	13.29	19.36	25.84	38.14	50.28	74.20	97.80	144.34	190.25	136.35	103.72	82.31	67.37	56.46	48.21	41.79	36.67	29.10	23.82	0.00	
14	1.27	3.05	5.94	14.31	20.85	27.83	41.08	54.14	79.91	105.32	155.44	204.89	152.38	115.92	91.99	75.29	63.10	53.87	46.70	40.98	32.52	10.23	0.00	
15	1.36	3.27	6.36	15.33	22.33	29.82	44.01	58.01	85.61	112.85	166.55	219.52	169.00	128.56	102.02	83.50	69.98	59.75	51.79	45.45	36.07	0.00		
16	1.45	3.49	6.78	16.35	23.82	31.81	46.94	61.88	91.32	120.37	177.65	234.16	186.17	141.63	112.39	91.99	77.09	65.82	57.05	50.07	39.74	0.00		
17	1.54	3.71	7.21	17.37	25.31	33.80	49.88	65.74	97.03	127.89	188.75	248.79	203.90	155.11	123.09	100.75	84.43	72.09	62.49	54.84	0.00			
18	1.63	3.92	7.63	18.40	26.80	35.78	52.81	69.61	102.74	135.42	199.86	263.43	222.15	169.00	134.11	109.77	91.99	78.54	68.08	59.75	0.00			
19	1.72	4.14	8.06	19.42	28.29	37.77	55.75	73.48	108.45	142.94	210.96	278.06	240.92	183.27	145.44	119.04	99.76	85.18	73.83	64.80	0.00			
20	1.81	4.36	8.48	20.44	29.78	39.76	58.68	77.35	114.15	150.46	222.06	292.70	260.19	197.93	157.07	128.56	107.74	91.99	79.74	55.31	0.00			
21	1.90	4.58	8.90	21.46	31.27	41.75	61.62	81.21	119.86	157.99	233.17	307.33	279.94	212.96	169.00	138.32	115.92	98.97	85.79	0.00				
22	1.99	4.80	9.33	22.48	32.76	43.74	64.55	85.08	125.57	165.51	244.27	321.97	300.17	228.35	181.21	148.32	124.30	106.13	87.35	0.00				
23	2.08	5.01	9.75	23.50	34.25	45.72	67.48	88.95	131.28	173.03	255.37	336.60	320.87	244.10	193.70	158.54	132.87	113.45	29.32	0.00				
24	2.17	5.23	10.18	24.53	35.74	47.71	70.42	92.82	136.98	180.56	266.48	351.24	342.02	260.19	206.47	169.00	141.63	120.92	0.00					
25	2.26	5.45	10.60	25.55	37.22	49.70	73.35	96.68	142.69	188.08	277.58	365.87	363.62	276.62	219.51	179.67	150.57	96.16	0.00					
26	2.35	5.67	11.03	26.57	38.71	51.69	76.29	100.55	148.40	195.60	288.68	380.51	385.66	293.38	232.81	190.55	159.69	37.53	0.00					
28	2.53	6.10	11.87	28.61	41.69	55.66	82.15	108.28	159.81	210.65	310.89	409.77	431.00	327.87	260.19	212.96	146.32	0.00						
30	2.71	6.54	12.72	30.66	44.67	59.64	88.02	116.02	171.23	225.69	333.09	439.04	477.99	363.62	288.56	236.18	30.96	0.00						
32	2.89	6.98	13.57	32.70	47.65	63.62	93.89	123.75	182.64	240.74	355.30	468.31	526.58	400.58	317.89	199.60	0.00							
35	3.17	7.63	14.84	35.77	52.11	69.58	102.69	135.36	199.77	263.31	388.61	512.22	602.34	458.22	363.62	28.22	0.00							
40	3.62	8.72	16.96	40.88	59.56	79.52	117.36	154.69	228.31	300.93	444.13	585.39	725.24	559.83	123.60	0.00								
45	4.07	9.81	19.08	45.99	67.00	89.46	132.03	174.03	256.84	338.54	499.64	658.57	750.00	333.00	0.00									
	Type A [Note (1)]				Type B [Note (2)]							Type C [Note (3)]												

NOTES:
(1) Type A: Manual or drip lubrication
(2) Type B: Bath or disc lubrication
(3) Type C: Oil stream lubrication

Table A-23 Horsepower Ratings, Single Strand Roller Chain No. 200 (2.500 in. Pitch)

No. of Teeth	Speed, Revolutions/min, Small Sprocket																							
	2	5	10	25	40	50	75	100	150	200	250	300	400	500	600	700	800	900	1,000	1,100	1,200	1,400	1,600	1,800
11	1.25	3.02	5.88	14.16	22.23	27.54	40.65	53.58	79.08	104.24	129.14	153.84	161.36	115.46	87.83	69.70	57.05	47.81	40.82	35.38	31.05	24.64	20.17	0.00
12	1.37	3.29	6.41	15.45	24.25	30.05	44.35	58.45	86.27	113.71	140.88	167.82	183.86	131.56	100.08	79.42	65.00	54.48	46.51	40.32	35.38	28.08	22.98	0.00
13	1.48	3.57	6.94	16.73	26.28	32.55	48.04	63.33	93.46	123.19	152.62	181.81	207.31	148.34	112.85	89.55	73.30	61.43	52.45	45.46	39.90	31.66	0.00	
14	1.59	3.84	7.48	18.02	28.30	35.06	51.74	68.20	100.65	132.66	164.36	195.79	231.69	165.78	126.11	100.08	81.91	68.65	58.61	50.80	44.59	35.38	0.00	
15	1.71	4.12	8.01	19.31	30.32	37.56	55.43	73.07	107.84	142.14	176.09	209.78	256.95	183.86	139.87	110.99	90.85	76.13	65.00	56.34	49.45	37.46	0.00	
16	1.82	4.39	8.55	20.60	32.34	40.06	59.13	77.94	115.03	151.61	187.83	223.76	283.07	202.55	154.08	122.27	100.08	83.87	71.61	62.07	54.48	0.00		
17	1.94	4.67	9.08	21.88	34.36	42.57	62.83	82.81	122.22	161.09	199.57	237.75	310.02	221.83	168.75	133.91	109.61	91.86	78.43	67.98	59.66	0.00		
18	2.05	4.94	9.61	23.17	36.38	45.07	66.52	87.68	129.41	170.57	211.31	251.73	331.81	241.69	183.86	145.90	119.42	100.08	85.45	74.07	65.00	0.00		
19	2.16	5.22	10.15	24.46	38.40	47.58	70.22	92.55	136.59	180.04	223.05	265.72	350.24	262.11	199.39	158.23	129.51	108.53	92.67	80.32	2.22	0.00		
20	2.28	5.49	10.68	25.74	40.42	50.08	73.91	97.42	143.78	189.52	234.79	279.70	368.67	283.07	215.34	170.88	139.87	117.21	100.08	86.75	0.00			
21	2.39	5.77	11.22	27.03	42.45	52.59	77.61	102.29	150.97	198.99	246.53	293.69	387.11	304.56	231.69	183.86	150.49	126.11	107.68	32.68	0.00			
22	2.51	6.04	11.75	28.32	44.47	55.09	81.30	107.17	158.16	208.47	258.27	307.68	405.54	326.57	248.43	197.15	161.36	135.23	115.46	0.00				
23	2.62	6.31	12.28	29.61	46.49	57.59	85.00	112.04	165.35	217.95	270.01	321.66	423.97	349.09	265.56	210.74	172.49	144.55	104.48	0.00				
24	2.73	6.59	12.82	30.89	48.51	60.10	88.70	116.91	172.54	227.42	281.75	335.65	442.41	372.10	283.07	224.63	183.86	154.08	21.71	0.00				
25	2.85	6.86	13.35	32.18	50.53	62.60	92.39	121.78	179.73	236.90	293.49	349.63	460.84	395.60	300.94	238.82	195.47	163.81	0.00					
26	2.96	7.14	13.89	33.47	52.55	65.11	96.09	126.65	186.92	246.37	305.23	363.62	479.27	419.57	319.18	253.29	207.31	151.14	0.00					
	Type A [Note (1)]				Type B [Note (2)]								Type C [Note (3)]											

NOTES:
(1) Type A: Manual or drip lubrication
(2) Type B: Bath or disc lubrication
(3) Type C: Oil stream lubrication

Table A-24 Horsepower Ratings, Single Strand Roller Chain No. 200H (2.500 in. Pitch)

No. of Teeth	Speed, Revolutions/min, Small Sprocket																							
	2	5	10	25	33	50	75	100	150	200	250	300	400	500	600	700	800	900	1,000	1,100	1,200	1,400	1,600	1,800
11	1.37	3.31	6.44	15.51	20.25	30.17	44.53	58.70	86.63	114.18	141.46	168.52	161.36	115.46	87.83	69.70	57.05	47.81	40.82	35.38	31.05	24.64	20.17	0.00
12	1.50	3.61	7.02	16.92	22.09	32.92	48.58	64.03	94.51	124.57	154.32	183.84	183.86	131.56	100.08	79.42	65.00	54.48	46.51	40.32	35.38	28.08	18.78	0.00
13	1.62	3.91	7.61	18.33	23.93	35.66	52.63	69.37	102.38	134.95	167.18	199.16	207.31	148.34	112.85	89.55	73.30	61.43	52.45	45.46	39.90	31.66	0.00	
14	1.75	4.21	8.19	19.74	25.77	38.40	56.68	74.71	110.26	145.33	180.04	214.48	231.69	165.78	126.11	100.08	81.91	68.65	58.61	50.80	44.59	35.38	0.00	
15	1.87	4.51	8.78	21.15	27.61	41.15	60.73	80.04	118.13	155.71	192.90	229.80	256.95	183.86	139.87	110.99	90.85	76.13	65.00	56.34	49.45	0.00		
16	2.00	4.81	9.36	22.56	29.45	43.89	64.77	85.38	126.01	166.09	205.76	245.12	283.07	202.55	154.08	122.27	100.08	83.87	71.61	62.07	54.48	0.00		
17	2.12	5.11	9.95	23.97	31.29	46.63	68.82	90.71	133.88	176.47	218.62	260.44	310.02	221.83	168.75	133.91	109.61	91.86	78.43	67.98	59.66	0.00		
18	2.25	5.41	10.53	25.38	33.13	49.38	72.87	96.05	141.76	186.85	231.48	275.76	337.77	241.69	183.86	145.90	119.42	100.08	85.45	74.07	11.75	0.00		
19	2.37	5.71	11.12	26.79	34.97	52.12	76.92	101.39	149.63	197.23	244.35	291.08	366.30	262.11	199.39	158.23	129.51	108.53	92.67	80.32	0.00			
20	2.50	6.02	11.70	28.20	36.82	54.86	80.97	106.72	157.51	207.61	257.21	306.40	395.60	283.07	215.34	170.88	139.87	117.21	100.08	31.07	0.00			
21	2.62	6.32	12.29	29.61	38.66	57.60	85.02	112.06	165.38	217.99	270.07	321.72	425.64	304.56	231.69	183.86	150.49	126.11	107.68	0.00				
22	2.75	6.62	12.87	31.02	40.50	60.35	89.07	117.40	173.26	228.37	282.93	337.04	456.40	326.57	248.43	197.15	161.36	135.23	86.70	0.00				
23	2.87	6.92	13.46	32.43	42.34	63.09	93.11	122.73	181.14	238.75	295.79	352.36	464.44	349.09	265.56	210.74	172.49	144.55	11.76	0.00				
24	3.00	7.22	14.04	33.84	44.18	65.83	97.16	128.07	189.01	249.13	308.65	367.68	484.64	372.10	283.07	224.63	183.86	154.08	0.00					
25	3.12	7.52	14.63	35.25	46.02	68.58	101.21	133.40	196.89	259.51	321.51	383.00	504.83	395.60	300.94	238.82	195.47	118.72	0.00					
26	3.24	7.82	15.21	36.66	47.86	71.32	105.26	138.74	204.76	269.89	334.37	398.32	525.02	419.57	319.18	253.29	207.31	46.33	0.00					
	Type A [Note (1)]				Type B [Note (2)]								Type C [Note (3)]											

NOTES:
(1) Type A: Manual or drip lubrication
(2) Type B: Bath or disc lubrication
(3) Type C: Oil stream lubrication

Table A-25 Horsepower Ratings, Single Strand Roller Chain No. 240 (3.000 in. Pitch)

No. of Teeth	Speed, Revolutions/min, Small Sprocket																							
	2	5	10	25	36	50	75	100	150	200	250	300	400	500	600	700	800	900	1,000	1,100	1,200	1,300	1,400	1,500
11	2.02	4.86	9.46	22.81	32.36	44.36	65.47	86.30	127.37	167.88	207.99	247.77	186.70	133.59	101.63	80.65	66.01	55.32	47.23	40.94	35.93	31.87	28.51	0.00
12	2.20	5.31	10.32	24.88	35.31	48.40	71.43	94.15	138.95	183.14	226.89	270.30	212.73	152.22	115.80	91.89	75.21	63.03	53.82	46.65	40.94	36.31	2.11	0.00
13	2.39	5.75	11.18	26.95	38.25	52.43	77.38	101.99	150.53	198.41	245.80	292.82	239.87	171.64	130.57	103.61	84.81	71.07	60.68	52.60	46.16	38.13	0.00	
14	2.57	6.19	12.04	29.02	41.19	56.46	83.33	109.84	162.11	213.67	264.71	315.34	268.07	191.82	145.92	115.80	94.78	79.43	67.82	58.78	51.59	0.00		
15	2.75	6.63	12.90	31.10	44.13	60.50	89.28	117.68	173.68	228.93	283.62	337.87	297.30	212.73	161.83	128.42	105.11	88.09	75.21	65.19	0.00			
16	2.94	7.08	13.76	33.17	47.08	64.53	95.24	125.53	185.26	244.19	302.53	360.39	327.52	234.35	178.28	141.47	115.80	97.04	82.86	71.82	0.00			
17	3.12	7.52	14.62	35.24	50.02	68.56	101.19	133.37	196.84	259.45	321.43	382.92	358.70	256.66	195.25	154.94	126.82	106.28	90.74	0.00				
18	3.30	7.96	15.48	37.32	52.96	72.59	107.14	141.22	208.42	274.71	340.34	405.44	390.81	279.64	212.73	168.81	138.17	115.80	98.87	0.00				
19	3.49	8.40	16.34	39.39	55.90	76.63	113.09	149.06	220.00	289.98	359.25	427.97	423.82	303.26	230.70	183.08	149.84	125.58	3.20	0.00				
20	3.67	8.84	17.20	41.46	58.84	80.66	119.04	156.91	231.58	305.24	378.16	450.49	457.72	327.52	249.15	197.72	161.83	135.62	0.00					
21	3.85	9.29	18.07	43.54	61.79	84.69	125.00	164.76	243.16	320.50	397.07	473.02	492.48	352.39	268.07	212.73	174.12	109.86	0.00					
22	4.04	9.73	18.93	45.61	64.73	88.73	130.95	172.60	254.74	335.76	415.97	495.54	528.07	377.85	287.44	228.10	186.70	0.00						
23	4.22	10.17	19.79	47.68	67.67	92.76	136.90	180.45	266.32	351.02	434.88	518.07	564.48	403.91	307.26	243.83	199.57	0.00						
24	4.40	10.61	20.65	49.76	70.61	96.79	142.85	188.29	277.89	366.29	453.79	540.59	601.69	430.53	327.52	259.91	188.30	0.00						
25	4.59	11.06	21.51	51.83	73.55	100.83	148.81	196.14	289.47	381.55	472.70	563.12	639.68	457.72	348.20	276.32	73.47	0.00						
26	4.77	11.50	22.37	53.90	76.50	104.86	154.76	203.98	301.05	396.81	491.61	585.64	678.45	485.46	369.30	293.06	0.00							
	Type A [Note (1)]				Type B [Note (2)]								Type C [Note (3)]											

NOTES:

(1) Type A: Manual or drip lubrication

(2) Type B: Bath or disc lubrication

(3) Type C: Oil stream lubrication

Table A-26 Horsepower Ratings, Single Strand Roller Chain No. 240H (3.000 in. Pitch)

No. of Teeth	Speed, Revolutions/min, Small Sprocket																							
	2	5	10	25	27	50	75	100	150	200	250	300	400	500	600	700	800	900	1,000	1,100	1,200	1,300	1,400	1,500
11	2.33	5.62	10.93	26.33	28.35	51.23	75.60	99.65	147.07	193.85	240.16	286.10	186.70	133.59	101.63	80.65	66.01	55.32	47.23	40.94	35.93	31.87	28.51	0.00
12	2.54	6.13	11.92	28.73	30.93	55.88	82.48	108.71	160.44	211.48	262.00	312.11	212.73	152.22	115.80	91.89	75.21	63.03	53.82	46.65	40.94	36.31	0.00	
13	2.75	6.64	12.91	31.12	33.51	60.54	89.35	117.77	173.81	229.10	283.83	338.12	239.87	171.64	130.57	103.61	84.81	71.07	60.68	52.60	46.16	0.00		
14	2.97	7.15	13.91	33.52	36.09	65.20	96.22	126.83	187.18	246.72	305.66	364.13	268.07	191.82	145.92	115.80	94.78	79.43	67.82	58.78	18.18	0.00		
15	3.18	7.66	14.90	35.91	38.66	69.85	103.10	135.89	200.55	264.35	327.50	390.14	297.30	212.73	161.83	128.42	105.11	88.09	75.21	65.19	0.00			
16	3.39	8.17	15.89	38.30	41.24	74.51	109.97	144.95	213.92	281.97	349.33	416.15	327.52	234.35	178.28	141.47	115.80	97.04	82.86	0.00				
17	3.60	8.68	16.89	40.70	43.82	79.17	116.84	154.01	227.29	299.59	371.16	442.16	358.70	256.66	195.25	154.94	126.82	106.28	90.74	0.00				
18	3.81	9.19	17.88	43.09	46.40	83.83	123.72	163.07	240.66	317.21	392.99	468.17	390.81	279.64	212.73	168.81	138.17	115.80	16.92	0.00				
19	4.03	9.70	18.87	45.48	48.97	88.48	130.59	172.13	254.03	334.84	414.83	494.18	423.82	303.26	230.70	183.08	149.84	125.58	0.00					
20	4.24	10.21	19.87	47.88	51.55	93.14	137.46	181.18	267.40	352.46	436.66	520.19	457.72	327.52	249.15	197.72	161.83	98.33	0.00					
21	4.45	10.72	20.86	50.27	54.13	97.80	144.33	190.24	280.78	370.08	458.49	546.19	492.48	352.39	268.07	212.73	174.12	0.00						
22	4.66	11.23	21.85	52.67	56.71	102.45	151.21	199.30	294.15	387.71	480.33	572.20	528.07	377.85	287.44	228.10	186.70	0.00						
23	4.87	11.74	22.85	55.06	59.28	107.11	158.08	208.36	307.52	405.33	502.16	598.21	564.48	403.91	307.26	243.83	153.53	0.00						
24	5.09	12.26	23.84	57.45	61.86	111.77	164.95	217.42	320.89	422.95	523.99	624.22	601.69	430.53	327.52	259.91	48.97	0.00						
25	5.30	12.77	24.83	59.85	64.44	116.42	171.83	226.48	334.26	440.58	545.83	650.23	639.68	457.72	348.20	276.32	0.00							
26	5.51	13.28	25.83	62.24	67.02	121.08	178.70	235.54	347.63	458.20	567.66	676.24	678.45	485.46	369.30	293.06	0.00							
	Type A [Note (1)]				Type B [Note (2)]							Type C [Note (3)]												

NOTES:
(1) Type A: Manual or drip lubrication
(2) Type B Bath or disc lubrication
(3) Type C: Oil stream lubrication

NONMANDATORY APPENDIX B
SUPPLEMENTARY INFORMATION ON EQUATIONS FOR POWER RATINGS[1]

B-1 TERMS AND DEFINITIONS

The nomenclature defined below is used in this Nonmandatory Appendix.

k_X = constant related to the limiting factor
n_S = speed of small sprocket, revolutions/min
P_B = power capacity, limited by oil bath or slinger disc lubrication, hp
P_D = power capacity, limited by manual or drip lubrication, hp
P_G = power capacity, limited by galling between pin and bushing, hp
P_L = power capacity, limited by link plate fatigue, hp
P_R = power capacity, limited by roller–bushing impact fatigue, hp
p = chain pitch, in.
T_H = link plate thickness, heavy series, in.
T_S = link plate thickness, standard series, in.
z_S = number of teeth on small sprocket

B-2 GRAPH OF POWER RATINGS

A sample graph of the power ratings, for no. 60 single-strand chain, is shown in Fig. B-1. The power capacity of roller chains is limited by link plate fatigue, roller–bushing impact fatigue, galling between the pin and bushing, and the type of lubrication. The power rating for the chain is the least of these values at the specified speed with the specified lubrication method. Callouts on the graph identify which limits apply to the various regions of the rating.

B-3 EQUATION FOR POWER LIMITED BY LINK PLATE FATIGUE

For no. 25 through no. 240,

$$P_L = k_L z_S n_S^{0.96} p^{(3.0 - 0.07p)}$$

where

k_L = 0.0044 for standard series, except no. 41
= $0.0044(T_H/T_S)^{0.5}$ for heavy series
= 0.00242 for no. 41

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

B-4 EQUATION FOR POWER LIMITED BY ROLLER–BUSHING IMPACT FATIGUE

For no. 25 through no. 240,

$$P_R = \frac{k_R z_S^{1.5} p^{0.8}}{n_S^{1.5}}$$

where

k_R = 17,000 for no. 40 through no. 240, standard and heavy series
= 29,000 for no. 25 and no. 35
= 3,400 for no. 41

B-5 EQUATIONS FOR POWER LIMITED BY GALLING BETWEEN PINS AND BUSHINGS

For no. 25 through no. 240, standard series, except no. 41,

$$P_G = 6.452 p^2 z_S - \frac{n_S^3 p^5 z_S^3 (2 + 0.03226 z_S)}{3.96 \times 10^{12}}$$

For no. 41, use the same limits as for no. 40.
For no. 60H through no. 240H, heavy series,

$$P_G = 5.807 p^2 z_S - \frac{n_S^3 p^5 z_S^3 (2 + 0.03226 z_S)}{3.96 \times 10^{12}}$$

B-6 EQUATIONS FOR POWER LIMITED BY OIL BATH OR SLINGER DISC LUBRICATION

For no. 25 through no. 240, standard series, except no. 41,

$$P_G = 3.226 p^2 z_S - \frac{n_S^3 p^5 z_S^3 (2 + 0.03226 z_S)}{3.96 \times 10^{12}}$$

For no. 41, use the same limits as for no. 40.
For no. 60H through no. 240H, heavy series,

$$P_G = 2.903 p^2 z_S - \frac{n_S^3 p^5 z_S^3 (2 + 0.03226 z_S)}{3.96 \times 10^{12}}$$

B-7 EQUATIONS FOR POWER LIMITED BY MANUAL OR DRIP LUBRICATION

For no. 25 through no. 240, standard series, except no. 41,

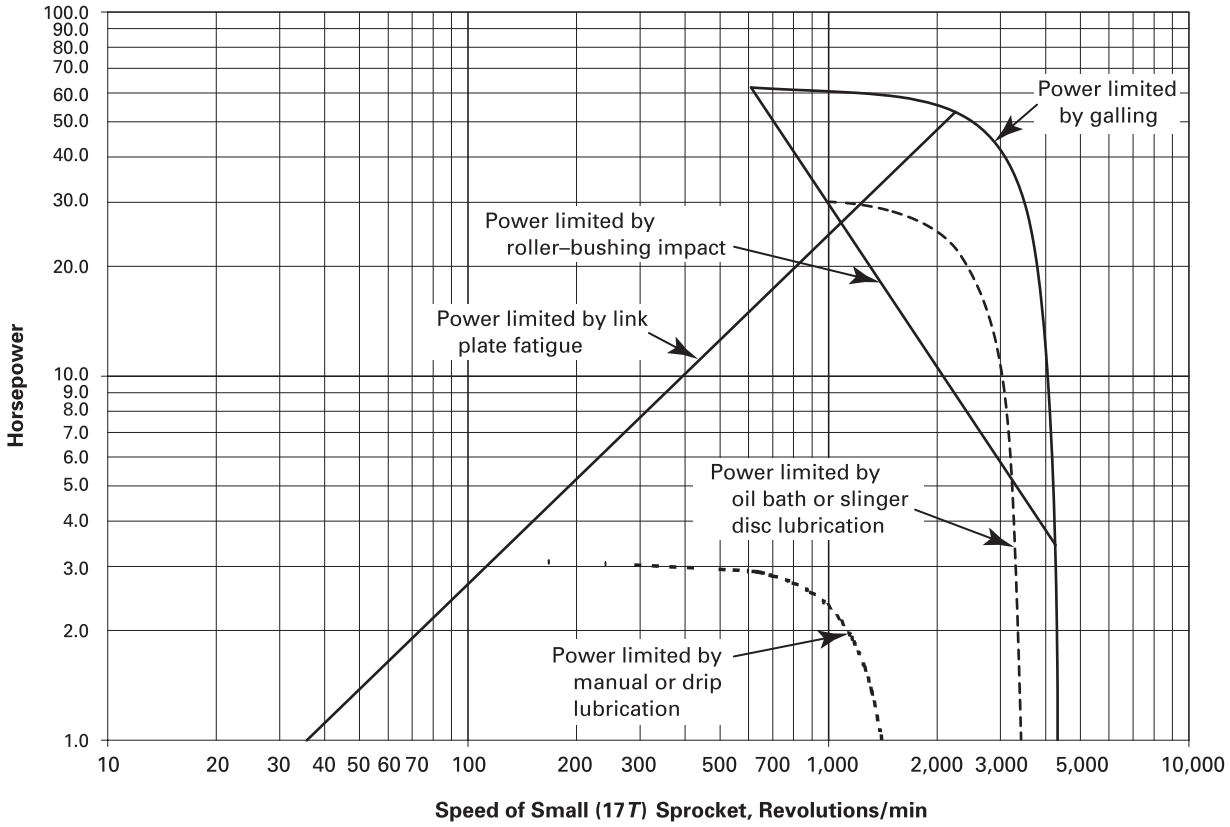
$$P_G = 0.3226p^2z_S - \frac{n_S^3p^5z_S^3(2 + 0.03226z_S)}{3.96 \times 10^{12}}$$

For no. 41, use the same limits as for no. 40.

For no. 60H through no. 240H, heavy series,

$$P_G = 0.2903p^2z_S - \frac{n_S^3p^5z_S^3(2 + 0.03226z_S)}{3.96 \times 10^{12}}$$

Fig. B-1 Sample Graph of Power Ratings



NONMANDATORY APPENDIX C
SUPPLEMENTARY INFORMATION ON SPROCKET CUTTING TOOLS[1]

C-1 STANDARD ROLLER CHAIN SPROCKET CUTTER DESIGNS

The following three kinds of sprocket cutters are used:

(a) space cutters, of which five will be required to cut 7 or more teeth for any given roller diameter. The ranges of teeth are 7–8, 9–11, 12–17, 18–34, and 35 and over. Single-purpose cutters of this type are necessary for fewer than 7 teeth. (See para. C-2.)

(b) hobs, of which only one will be required if of the nontopping type, to cut any number of teeth for a given pitch and roller diameter. Refer to Fig. C-1 for topping hob tooth form.

(c) shaper cutters, for use on gear shaping equipment, of which only one will be required if of the nontopping type, to cut 12 or more teeth for a given pitch and roller diameter. When sprockets of fewer than 12 teeth are to be produced on gear shaping equipment, consult the cutter manufacturer.

C-2 SPACE CUTTERS

Space cutters are made for the following ranges of teeth: 7–8, 9–11, 12–17, 18–34, and 35 and over. The lowest number of teeth in any group is designated by N_1 and the highest by N_2.

The cutters are based on an intermediate number of teeth, N_a, equal to $2N_1N_2/(N_1 + N_2)$, but the topping curve radius, F, is designed to produce adequate tooth height on a sprocket of N_2 teeth. The values of N_a for the cutters are 7.47, 9.9, 14.07, 23.54, and 56.

The angle Xab is $180/N$ when the cutter is made for a specific number of teeth. For design of cutters covering a range of teeth, angle Xab was determined by layout to ensure chain roller clearance and to avoid pointed teeth on the larger sprockets of each range. It has values as given in Table C-1 or Table C-1M for cutters covering a range of teeth as here designed. The formulas of Tables C-1 and C-1M are especially for cutters covering the standard ranges of teeth (N_a = intermediate values from above). For other points, use the value of N_a for N in the standard formulas for standard tooth form.

Recommended space cutter sizes for roller chain sprockets are given in Tables C-2 and C-2M.

Mark all space cutters with pitch, roller diameter, and range of teeth to be cut.

C-3 HOBS

C-3.1 General

Hobs (see Fig. C-1) designed for a given roller diameter, D_r, and chain pitch, P, will cut any number of teeth if of the nontopping type. For topping hobs, five will be required to cut 7 or more teeth for any given roller diameter (see Tables C-3 and C-3M). The ranges of teeth are 7–8, 9–11, 12–17, 18–34, and 35 and over.

C-3.2 Marking of Hobs

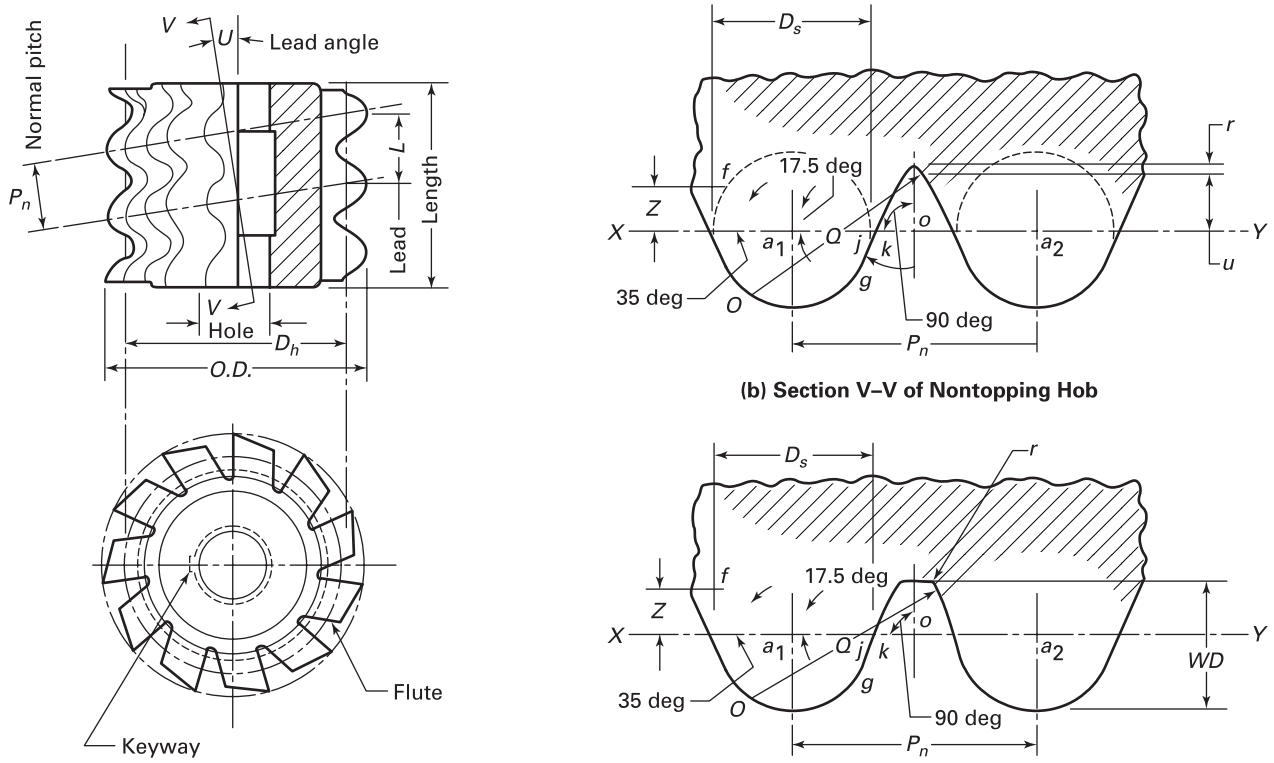
All hobs are to be marked with chain pitch, roller diameter, lead angle, flute lead, "TOP" if of the topping type or "NONTOP" if of the nontopping type, and the range of teeth cut if of the topping type.

C-4 SHAPER CUTTERS

Refer to the cutter manufacturer for the cutter form design for cutters to be used in the manufacture of sprockets on gear shaping equipment.

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

Fig. C-1 Hob Outline and Tooth Form



(a) Hob Outline

(b) Section V–V of Nontopping Hob

(c) Section V–V of Topping Hob

D_r = roller diameter
D_s = minimum diameter of seating curve
= $1.005D_r + 0.003$, in.
f = radius center for arc gk
j = point of intersection of line XY with circle of diameter D_s
L = lead

$$= \frac{P_n}{\cos U}$$

$O.D.$ = outside diameter
= 1.7 (hole + D_r + $0.7P$) approximately
P = chain pitch
P_n = normal pitch of hob
= $1.011P$
r = radius of fillet circle
= $0.03P$

GENERAL NOTES:

(a) Calculations:

$a_1o = oa_2 = P_n/2$

$D_h = O.D. - D_s$

$$F = D_r\left[0.8\cos\left(18\text{ deg} - \frac{56\text{ deg}}{N_a}\right) + 1.4\cos\left(17\text{ deg} + \frac{116\text{ deg}}{N_a} - Xab\right) - 1.3025\right] - 0.0015, \text{ in.}$$

$$U = \sin^{-1}\frac{P_n}{\pi D_h}$$

Fig. C-1 Hob Outline and Tooth Form (Cont'd)

GENERAL NOTES (Cont'd):

$$u = 0.27P$$

$$V = 1.4D_r \sin Xab$$

$$W = 1.4D_r \cos Xab$$

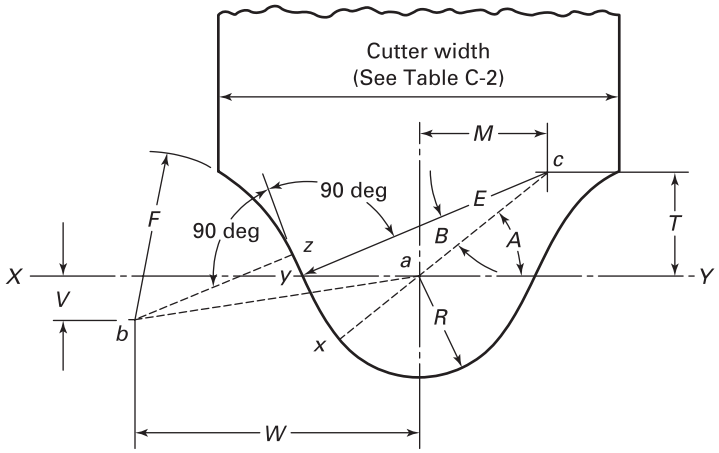
$$WD = \frac{D_r}{2} + P\left(0.3 - \frac{\tan \frac{90 \text{ deg}}{N_a}}{2}\right)$$

$$yz = D_r\left[1.4 \sin\left(17 \text{ deg} + \frac{116 \text{ deg}}{N_a} - Xab\right) - 0.8 \sin\left(18 \text{ deg} - \frac{56 \text{ deg}}{N_a}\right)\right]$$

$$Z = 0.287D_s$$

(b) O is located on line passing through f and j.
(c) Q is found by trial and is tangent to arc kg at k and to fillet radius.
(d) Length equals not less than two times bore, or $6D_r$, or $3.2P$.

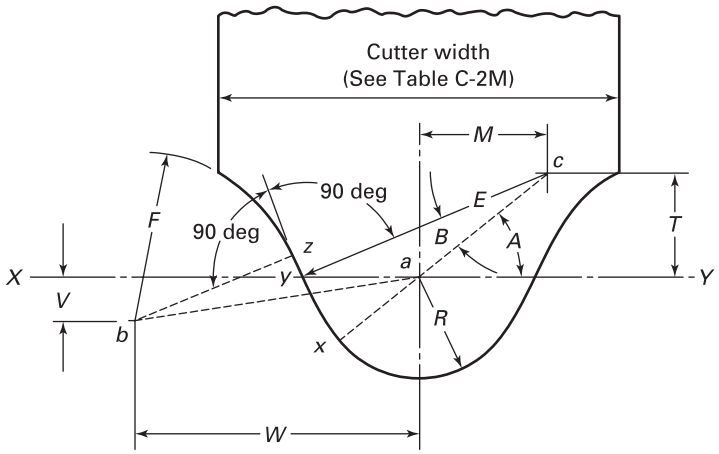
Table C-1 Construction Data for Space Cutter Layout, in.



Teeth Range	*M*	*W*	*V*	*T*	*F*	Chord *xy*	*yz*	Angle *Xab*
7– 8	$0.5848D_r$	$1.2790D_r$	$0.5694D_r$	$0.5459D_r$	$0.8686D_r - 0.0015$	$0.2384D_r + 0.0003$	$0.0618D_r$	24 deg
9–11	$0.6032D_r$	$1.3302D_r$	$0.4365D_r$	$0.5255D_r$	$0.8554D_r - 0.0015$	$0.28D_r + 0.0003$	$0.0853D_r$	18 deg, 10 min
12–17	$0.6194D_r$	$1.3694D_r$	$0.2911D_r$	$0.5063D_r$	$0.8364D_r - 0.0015$	$0.3181D_r + 0.0004$	$0.1269D_r$	12 deg
18–34	$0.6343D_r$	$1.3947D_r$	$0.1220D_r$	$0.4875D_r$	$0.8073D_r - 0.0015$	$0.354D_r + 0.0004$	$0.1922D_r$	5 deg
35 and over	$0.6466D_r$	$1.4000D_r$	0	$0.4710D_r$	$0.7857D_r - 0.0015$	$0.385D_r + 0.0004$	$0.2235D_r$	0 deg

GENERAL NOTES:
(a) *E* (same for all ranges) = $1.3025D_r + 0.0015$
(b) *ab* (same for all ranges) = $1.4D_r$

Table C-1M Construction Data for Space Cutter Layout, mm



Teeth Range	*M*	*W*	*V*	*T*	*F*	Chord *xy*	*yz*	Angle *Xab*
7– 8	$0.5848D_r$	$1.2790D_r$	$0.5694D_r$	$0.5459D_r$	$0.8686D_r - 0.038$	$0.2384D_r + 0.008$	$0.0618D_r$	24 deg
9–11	$0.6032D_r$	$1.3302D_r$	$0.4365D_r$	$0.5255D_r$	$0.8554D_r - 0.038$	$0.28D_r + 0.008$	$0.0853D_r$	18 deg, 10 min
12–17	$0.6194D_r$	$1.3694D_r$	$0.2911D_r$	$0.5063D_r$	$0.8364D_r - 0.038$	$0.3181D_r + 0.010$	$0.1269D_r$	12 deg
18–34	$0.6343D_r$	$1.3947D_r$	$0.1220D_r$	$0.4875D_r$	$0.8073D_r - 0.038$	$0.354D_r + 0.010$	$0.1922D_r$	5 deg
35 and over	$0.6466D_r$	$1.4000D_r$	0	$0.4710D_r$	$0.7857D_r - 0.038$	$0.385D_r + 0.010$	$0.2235D_r$	0 deg

GENERAL NOTES:
(a) *E* (same for all ranges) = $1.3025D_r + 0.038$
(b) *ab* (same for all ranges) = $1.4D_r$

Table C-2 Recommended Space Cutter Sizes for Roller Chain Sprockets, in.

Standard Chain No.	Chain Pitch, *P*	Roller Diameter	Cutter Diameter						Cutter Width						Diameter of Hole
			6*T*	7–8*T*	9–11*T*	12–17*T*	18–34*T*	35*T* and Over	6*T*	7–8*T*	9–11*T*	12–17*T*	18–34*T*	35*T* and Over	
25	0.250	0.130	2.75	2.75	2.75	2.75	2.75	2.75	0.31	0.31	0.31	0.31	0.28	0.28	1.000
35	0.375	0.200	2.75	2.75	2.75	2.75	2.75	2.75	0.47	0.47	0.47	0.44	0.44	0.41	1.000
40	0.500	0.312	3.00	3.00	3.12	3.12	3.12	3.12	0.75	0.75	0.75	0.75	0.72	0.69	1.000
50	0.625	0.400	3.12	3.12	3.25	3.25	3.25	3.25	0.75	0.75	0.75	0.75	0.72	0.69	1.000
60	0.750	0.469	3.25	3.25	3.38	3.38	3.38	3.38	0.91	0.91	0.91	0.88	0.84	0.81	1.000
80	1.000	0.625	3.88	4.00	4.12	4.12	4.25	4.25	1.50	1.50	1.47	1.47	1.41	1.34	1.250
100	1.250	0.750	4.25	4.38	4.50	4.50	4.62	4.62	1.81	1.81	1.78	1.75	1.69	1.62	1.250
120	1.500	0.875	4.38	4.50	4.62	4.62	4.75	4.75	1.81	1.81	1.78	1.75	1.69	1.62	1.250
140	1.750	1.000	5.00	5.12	5.25	5.38	5.50	5.50	2.09	2.09	2.06	2.03	1.97	1.88	1.500
160	2.000	1.125	5.38	5.50	5.62	5.75	5.88	5.88	2.41	2.41	2.38	2.31	2.25	2.16	1.500
180	2.250	1.406	5.88	6.00	6.25	6.38	6.50	6.50	2.69	2.69	2.66	2.59	2.47	2.41	1.500
200	2.500	1.563	6.38	6.62	6.75	6.88	7.00	7.12	3.00	3.00	2.94	2.91	2.75	2.69	1.750
240	3.000	1.875	7.50	7.75	7.88	8.00	8.00	8.25	3.59	3.59	3.53	3.47	3.34	3.22	2.000

Table C-2M Recommended Space Cutter Sizes for Roller Chain Sprockets, mm

Standard Chain No.	Chain Pitch, *P*	Roller Diameter	Cutter Diameter						Cutter Width						Diameter of Hole
			6*T*	7–8*T*	9–11*T*	12–17*T*	18–34*T*	35*T* and Over	6*T*	7–8*T*	9–11*T*	12–17*T*	18–34*T*	35*T* and Over	
25	6.35	3.30	69.8	69.8	69.8	69.8	69.8	69.8	7.9	7.9	7.9	7.9	7.1	7.1	25.40
35	9.52	5.08	69.8	69.8	69.8	69.8	69.8	69.8	11.9	11.9	11.9	11.2	11.2	10.4	25.40
40	12.70	7.92	76.2	76.2	79.2	79.2	79.2	79.2	19.0	19.0	19.0	19.0	18.3	17.6	25.40
50	15.88	10.16	79.2	79.2	82.6	82.6	82.6	82.6	19.0	19.0	19.0	19.0	18.3	17.6	25.40
60	19.05	11.91	82.6	82.6	85.9	85.9	85.9	85.9	23.1	23.1	23.1	22.4	21.3	20.6	25.40
80	25.40	15.88	98.6	101.6	104.6	104.6	108.0	108.0	38.1	38.1	37.3	37.3	35.8	34.0	31.75
100	31.75	19.05	108.0	111.3	114.3	114.3	117.3	117.3	46.0	46.0	45.2	44.4	42.9	41.1	31.75
120	38.10	22.22	111.3	114.3	117.3	117.3	120.6	120.6	46.0	46.0	45.2	44.4	42.9	41.1	31.75
140	44.45	25.40	127.0	130.0	133.4	136.7	139.7	139.7	53.1	53.1	52.3	51.6	50.0	47.8	38.10
160	50.80	28.58	136.7	139.7	142.7	146.0	149.4	149.4	61.2	61.2	60.5	58.7	57.2	54.9	38.10
180	57.15	35.71	149.4	152.4	158.8	162.1	165.1	165.1	68.3	68.3	67.6	65.8	62.7	61.2	38.10
200	63.50	39.67	162.1	168.1	171.4	174.8	177.8	180.8	76.2	76.2	74.7	73.9	69.8	68.3	44.45
240	76.20	47.62	190.5	196.8	200.2	203.2	203.2	209.6	91.2	91.2	89.7	88.1	84.8	81.8	50.80

Table C-3 Recommended Hob Sizes for Roller Chain Sprockets, in.

Standard Chain No.	Chain Pitch, *P*	Roller Diameter	Hob Diameter	Hob Length	Hole Diameter
25	0.250	0.130	2.62	2.50	1.250
35	0.375	0.200	3.12	2.50	1.250
40	0.500	0.312	3.38	2.50	1.250
50	0.625	0.400	3.62	2.50	1.250
60	0.750	0.469	3.75	2.88	1.250
80	1.000	0.625	4.38	3.75	1.250
100	1.250	0.750	4.75	4.50	1.250
120	1.500	0.875	5.38	5.25	1.250
140	1.750	1.000	6.38	6.00	1.500
160	2.000	1.125	6.88	6.75	1.500
180	2.250	1.406	8.00	8.50	1.750
200	2.500	1.563	8.62	9.38	1.750
240	3.000	1.875	9.75	11.25	2.000

Table C-3M Recommended Hob Sizes for Roller Chain Sprockets, mm

Standard Chain No.	Chain Pitch, *P*	Roller Diameter	Hob Diameter	Hob Length	Hole Diameter
25	6.35	3.30	66.5	63.5	31.75
35	9.52	5.08	79.2	63.5	31.75
40	12.70	7.92	85.9	63.5	31.75
50	15.88	10.16	91.9	63.5	31.75
60	19.05	11.91	95.2	73.2	31.75
80	25.40	15.88	111.3	95.2	31.75
100	31.75	19.05	120.6	114.3	31.75
120	38.10	22.22	136.7	133.4	31.75
140	44.45	25.40	162.1	152.4	38.10
160	50.80	28.58	174.8	171.4	38.10
180	57.15	35.71	203.2	215.9	44.45
200	63.50	39.67	218.9	238.3	44.45
240	76.20	47.62	247.6	285.8	50.80

B29 AMERICAN NATIONAL STANDARDS — CHAINS, ATTACHMENTS, AND SPROCKETS FOR POWER TRANSMISSION AND CONVEYING

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