SELECTION GUIDELINES

There are two methods to determine the right drive chain for your application: Standard and Working Load. To determine the suggested chain, follow Steps 1-10 of the **Standard Selection Procedure** on pages A-5 through A-7. An example procedure is shown on page A-15.

Each selection procedure is intended to be used for Engineering Class Drive Chain (ASME/ANSI Standard B29.10).

STANDARD SELECTION PROCEDURE

Step 1: Determine Class of Driven Load

From the Application Classifications Table 1 determine the class of the driven load: uniform load, moderate shock, heavy shock.

Table 1 — Application Classifications

Application	Load Class[1]
Agitators	
Pure Liquids	U
Liquids and Solids	M
Liquids – Variable Density	M
Blowers	
Centrifugal	U
Lobe	M
Vane	U
Brewing and Distilling	
Bottling Machinery	U
Brew Kettles – Cont. Duty	U
Cookers – Cont. Duty	U
Mash Tubs – Cont. Duty	U
Scale Hopper, Freq. Starts	M
Can Filling Machines	U
Cane Knives	M
Car Dumpers	H
Car Pullers	M
Clarifiers	U
Classifiers	M
Clay Working Machinery	
Brick Press	H
Briquette Machine	H
Clay Working Machinery	M
Pub Mill	M
Compressors	
Centrifugal	U
Lobe	M
Reciprocating, Multi-Cylinder	M
Reciprocating, Single-Cylinder	H
Conveyors – Uniformly Loaded or Fed	
Apron	U
Assembly	U
Belt	U
Bucket	U
Chain	U
Flight	U
Conveyors – Uniformly Loaded or Fed (Continued)	
Oven	U
Screw	U
Conveyors – Heavy Duty Not Uniformly Fed	
Apron	M
Assembly	M
Belt	M
Bucket	M
Chain	M
Flight	M
Live Roll	M
Oven	M
Reciprocating	H
Screw	M
Shaker	H
Cranes	
Main Hoists	U
Bridge Travel	M
Trolley Travel	M
Crusher	
Ore	H
Stone	H
Sugar	M
Dredges	
Cable Reels	M
Conveyors	M
Cutter Head Drives	H
Jig Drives	H
Maneuvering Winches	M
Pumps	M
Screen Drive	H
Stackers	M
Utility Winches	M
Dry Dock Cranes	
Main Hoist, Auxiliary Hoist, Boom (Luffing)	U
Dry Dock Cranes (Continued)	
Rotating (Swing or Slew)	M
Tracking (Drive Wheels)	H
Elevators	
Bucket – Uniform Load	U
Bucket – Heavy Load	M
Bucket – Cont. Centrifugal Discharge	U
Escalators	U
Freight	M
Gravity Discharge	U
Man Lifts	H
Passenger	H
Fans	
Centrifugal	U
Cooling Towers – Induced Draft	U
Cooling Towers – Forced Draft	U
Induced Draft	M
Large (Mine, etc.)	M
Large (Industrial)	M
Light (Small Diameter)	U
Feeders	
Apron	M
Belt	M
Disc	U
Reciprocating	H
Screw	M
Food Industry	
Beet Slicer	M
Cereal Cooker	U
Dough Mixer	M
Meat Grinders	M
Generators (Not Welding)	U
Hammer Mills	H
Hoists	
Heavy Duty	H
Medium Duty	M
Skip Hoist	M
Laundry Washers	
Reversing	M
Laundry Tumblers	M
Line Shafts	
Driving Processing Equipment	M
Light	U
Other Line Shafts	U
Lumber Industry	
Barkers – Hydraulic, Mechanical	M
Burner Conveyor	M
Chain Saw and Drag Saw	H
Chain Transfer	H
Craneway Transfer	H
De-barking Drum	H
Edger Feed	M
Gang Feed	M
Green Chain	M
Live Rolls	H
Log Deck	H
Log Haul – Incline	H
Log Haul – Well Type	H
Log Turning Device	H
Main Log Conveyor	H
Off Bearing Rolls	M
Planer Feed Chains	M
Planer Floor Chains	M
Planer Tilting Hoist	M
Re-saw Merry-go-round Conveyor	M
Roll Cases	H
Slab Conveyor	H
Small Waste Conveyor – Belt	U
Small Waste Conveyor – Chain	M
Sorting Table	M
Tipple Hoist Conveyor	M
Tipple Hoist Drive	M
Transfer Conveyors	M

[1]U = Uniform load; M = Moderate shock; H = Heavy shock.

Required Information for Drive Selection

- Type of input horsepower (electric motor, internal combustion engine, etc.).
- Type of equipment to be driven.
- Horsepower to be transmitted.
- Full load speed of the fastest running shaft (RPM).
- Desired speed of the slow speed shaft (RPM).
  Note: If speeds are variable, determine maximum and minimum speed and HP to be transmitted at each speed.
- Diameters of the driving and driven shafts.
- Center to center distance of shafts.
  Note: If this dimension is adjustable, determine amount of adjustment.
- Position of drive and space limitations, if any.
- Proposed method of lubrication.
- Conditions of drive. Drives with more than two sprockets, idlers, or unusual conditions such as severely abrasive or corrosive atmosphere, extremely high or low temperatures, severely fluctuating loads, frequent stops and starts, etc., require special consideration. It is advisable to consult Union engineers for selections of this nature.

Table 1 — Application Classifications (Continued)

Application	Load Class[1]
Lumber Industry (Continued)	
Transfer Rolls	M
Tray Drive	M
Trimmer Feed	M
Waste Conveyor	M
Machine Tools	
Bending Roll	M
Punch Press – Gear Driven	H
Notching Press – Belt Driven	H
Plate Planers	H
Tapping Machine	H
Other Machine Tools – Main Drives	M
Other Machine Tools – Auxiliary Drives	U
Metal Mills	
Draw Bench Carriage and Main Drive	M
Pinch, Dryer and Scrubber Rolls, Reversing	H
Slitters	M
Table Conveyors – Non-Reversing Group Drives	M
Table Conveyors – Non-Reversing Individual Drives	H
Table Conveyors – Reversing	H
Wire Drawing and Flattening Machine	M
Wire Winding Machine	M
Mills, Rotary Type	
Ball	M
Cement Kilns	M
Dryers and Coolers	M
Kilns	M
Pebble	M
Rod, Plane and Wedge Bar	M
Tumbling Barrels	H
Mixers	
Concrete Mixers – Cont.	M
Concrete Mixers – Intermittent	M
Constant Density	U
Variable Density	M
Oil Industry	
Chillers	M
Oil Well Pumping	H
Paraffin Filter Press	M
Rotary Kilns	M
Paper Mills	
Agitators (Mixers)	M
Barker – Auxiliaries – Hydraulic	M
Barker – Mechanical	M
Barking Drum	H
Beater and Pulper	M
Bleacher	U
Calendars	M
Calendars – Super	H
Converting Machine, Except Cutters, Platers	M
Conveyors	U
Couch	M
Cutters – Platers	H
Cylinders	M
Dryers	M
Felt Stretcher	M
Felt Whipper	H
Jordans	H
Log Haul	H
Presses	U
Pulp Machine Reel	M
Stock Chests	M
Suction Roll	U
Washers and Thickeners	M
Winders	U
Printing Presses	U
Pullers	
Barge Haul	H
Pumps	
Centrifugal	U
Proportioning	M
Reciprocating – Single Acting, Three or more Cylinders	M
Reciprocating – Double Acting, Two or more Cylinders	M
Reciprocating – Single Acting, One or Two Cylinders	M
Reciprocating – Double Acting, Single Cylinder	M
Reciprocating – Rotary – Gear Type	U
Rotary – Lobe, Vane	U
Rubber and Plastics Industries	
Crackers	H
Laboratory Equipment	M
Mixing Mills	H
Refiners	M
Rubber Calendars	M
Rubber Mill (Two on Line)	M
Rubber Mill (Three on Line)	M
Sheeter	M
Tire Building Machines	M
Tire and Tube Press Openers	M
Tubers and Strainers	M
Warming Mills	M
Sand Muller	M
Sewage Disposal Equipment	
Bar Screens	U
Chemical Feeders	U
Collectors	U
Dewatering Screws	M
Scum Breakers	M
Sewage Disposal Equipment (Continued)	
Slow or Rapid Mixers	M
Thickeners	M
Vacuum Filters	M
Screens	
Air Washing	U
Rotary – Stone or Gravel	M
Traveling Water Intake	U
Slab Pushers	M
Steering Gear	H
Stokers	U
Sugar Industry	
Cane Knives	M
Crushers	M
Mills	H
Textile Industry	
Batchers	M
Calendars	M
Cards	M
Dry Cans	M
Dryers	M
Dyeing Machinery	M
Knitting Machines	M
Looms	M
Mangles	M
Nappers	M
Pads	M
Range Drives	M
Slashers	M
Soapers	M
Spinners	M
Tenter Frames	M
Washers	M
Winders	M
Windless	M

[1]U = Uniform load; M = Moderate shock; H = Heavy shock.

Step 2: Select Service Factor
From the Service Factors Table 2 below, select the number under the type of input power and opposite the class of driven load that most closely relates to the application.

Table 2 — 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
Uniform	1.0	1.0	1.2
Moderate Shock	1.2	1.3	1.4
Heavy Shock	1.4	1.5	1.7

Step 3: Calculate Design Horsepower
Design Horsepower = HP x Service Factor.

The Design Horsepower equals the Horsepower to be transmitted multiplied by the Service Factor selected in Step 2.

Step 4: Select Chain Pitch
Use the Quick Selection Chart (page A-10), to find chain pitch, as follows:

- Locate the design horsepower from Step 4 on the vertical axis.
- Locate the RPM of the small sprocket on the horizontal axis.
- The intersection of the two lines (design horsepower and RPM) will be in an area designated with the suggested chain pitch. If the intersection is near the borderline of the pitch area, the pitches on both sides of the line should be evaluated to obtain the most suitable selection.
- If the chain is not listed in the Quick Selection Chart, go to the Working Load Selection Guidelines.

Step 5: Select Number of Teeth in Small Sprocket
Horsepower Table Ratings for single strand chains are given on pages A-11 ~ A-14 for each chain pitch. Turn to the page giving the chain pitch obtained in Step 4 and select the number of teeth in the small sprocket:

- Read down the column in the Horsepower Ratings Table under the RPM of the small sprocket until the requested HP Table Rating is located. Read across the table to the first column (Number of Teeth Small Sprocket). This is the smallest number of teeth to specify for this application.
- Note the lubrication type specification in the table for this chain. This type of lubrication must be used to obtain reasonable service life.

Step 6: Determine Number of Teeth in Large Sprocket

$$N = \frac{rn}{R}$$

The number of teeth in the large sprocket equals the RPM of the small sprocket times the number of teeth in the small sprocket divided by the RPM of the large sprocket. Note: Hardened teeth are suggested for sprockets with less than 15 teeth, speeds greater than 600 RPM, ratios over 4:1, or in heavy loading or abrasive environments.

Step 7: Determine Suggested Minimum Center Distance; C = Chain Pitches

$$C = \frac{2N + n}{6}$$

This formula is to be used as a guide to MINIMUM center distances only. The final selection may vary slightly to suit clearance dimensions.

Step 8: Check Final Drive Design
Be sure that the sprockets and chain will fit into the available space.

Step 9: Specify Sprockets
Specify the sprockets selected. See Sprocket section in this catalog. Also, refer to Section C for standard keyway and set screw dimensions.

Step 10: Calculate Chain Length
To order the proper length of chain, use the following calculation:

$$\text{Chain Length in Pitches} = \frac{S}{2} + 2C + \frac{K}{C}$$

- Add number of teeth in small sprocket and number of teeth in large sprocket to obtain S.
- Subtract number of teeth in small sprocket from number of teeth in large sprocket to obtain value D. Find D in Table 3, and note corresponding value K.
- Divide center distance in inches by pitch of chain, obtaining C.
- Using these values, solve the formula above.

$$\text{Chain Length in Feet} = \frac{\text{Length in Pitches x Pitch in Inches}}{12}$$

A chain cannot contain a fractional part of a pitch. If the chain length obtained contains a fractional part of a pitch, use the next higher whole number.

Glossary
N = Number of teeth in large sprocket
n = Number of teeth in small sprocket
R = RPM large sprocket
r = RPM small sprocket
C = Shaft center distance in pitches
S = N + n
D = N - n

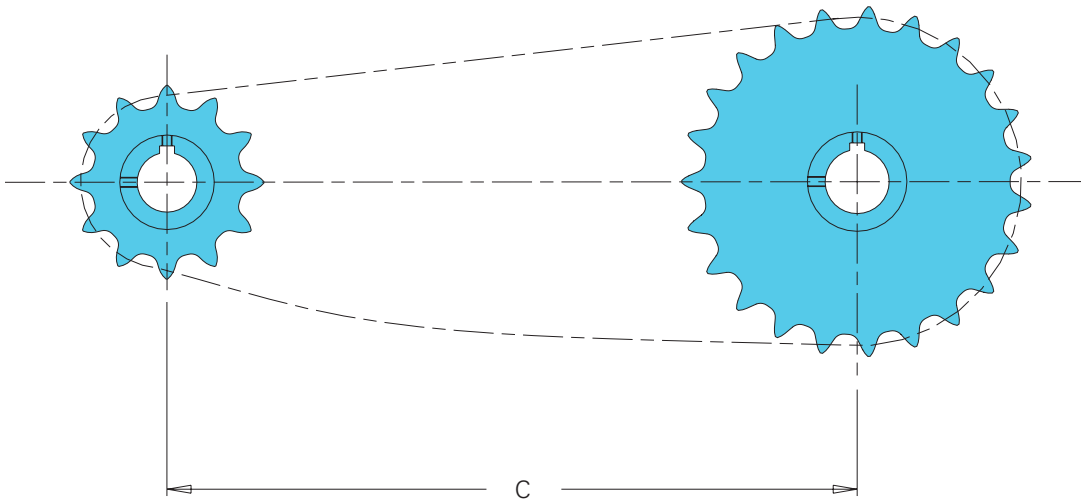


Table 3 — K Values[1]

D	K	D	K	D	K	D	K	D	K	D	K
1	.03	32	25.94	63	100.54	94	223.82	125	395.79	156	616.44
2	.10	33	27.58	64	103.75	95	228.61	126	402.14	157	624.37
3	.23	34	29.28	65	107.02	96	233.44	127	408.55	158	632.35
4	.41	35	31.03	66	110.34	97	238.33	128	415.01	159	640.38
5	.63	36	32.83	67	113.71	98	243.27	129	421.52	160	648.46
6	.91	37	34.68	68	117.13	99	248.26	130	428.08	161	656.59
7	1.24	38	36.58	69	120.60	100	253.30	131	434.69	162	664.77
8	1.62	39	38.53	70	124.12	101	258.39	132	441.36	163	673.00
9	2.05	40	40.53	71	127.69	102	263.54	133	448.07	164	681.28
10	2.53	41	42.58	72	131.31	103	268.73	134	454.83	165	689.62
11	3.06	42	44.68	73	134.99	104	273.97	135	461.64	166	698.00
12	3.65	43	46.84	74	138.71	105	279.27	136	468.51	167	706.44
13	4.28	44	49.04	75	142.48	106	284.67	137	475.42	168	714.92
14	4.96	45	51.29	76	146.31	107	290.01	138	482.39	169	723.46
15	5.70	46	53.60	77	150.18	108	295.45	139	489.41	170	732.05
16	6.48	47	55.95	78	154.11	109	300.95	140	496.47	171	740.68
17	7.32	48	58.36	79	158.09	110	306.50	141	503.59	172	749.37
18	8.21	49	60.82	80	162.11	111	312.09	142	510.76	173	758.11
19	9.14	50	63.33	81	166.19	112	317.74	143	517.98	174	766.90
20	10.13	51	65.88	82	170.32	113	323.44	144	525.25	175	775.74
21	11.17	52	68.49	83	174.50	114	329.19	145	532.57	176	784.63
22	12.26	53	71.15	84	178.73	115	334.99	146	539.94	177	793.57
23	13.40	54	73.86	85	183.01	116	340.84	147	547.36	178	802.57
24	14.59	55	76.62	86	187.34	117	346.75	148	554.83	179	811.61
25	15.83	56	79.44	87	191.73	118	352.70	149	562.36	180	820.70
26	17.12	57	82.30	88	196.16	119	358.70	150	569.93	181	829.85
27	18.47	58	85.21	89	200.64	120	364.76	151	577.56	182	839.04
28	19.86	59	88.17	90	205.18	121	370.86	152	585.23	183	848.29
29	21.30	60	91.19	91	209.76	122	377.02	153	592.96	184	857.58
30	22.80	61	94.25	92	214.40	123	383.22	154	600.73	185	866.93
31	24.34	62	97.37	93	219.08	124	389.48	155	608.56		

[1]Used to calculate chain length. See Step 10 on page A-7.

Alternate Working Load Selection Guidelines

Selection of drive chains not listed in the Quick Selection Chart by the Working Load method:

To use a chain that is not listed in the Quick Selection Chart , the proper chain can be selected from the working load values given in the chain listings. The working load required can be determined from the following:

Working Load

$$\frac{(HP) \times (396{,}000) \times (E) \times (V)}{(CP) \times (T) \times (RPM)}$$

Where:

HP = Actual horsepower required. (Use motor HP if actual is not known.)

CP = Chain pitch (inches)

T = Number of teeth in smaller sprocket. (12T are suggested.)

RPM = Speed of smaller sprocket.

E = Speed factor (from Speed Correction Factors Table 11 on page A-50. A 12T sprocket is suggested.)

V = Service factor (obtain from Service Factors Table 10 on page A-50.)

This Working Load formula is not to be compared with the selection tables since the tables involve other considerations in addition to working load. This formula is intended only to supplement the selection tables for those cases where a chain other than the ones listed in the selection procedure is required.

When the Working Load has been determined, select a chain which has a rated working load equal to or greater than the working load value.

Calculation of Shaft Centers

Use the following formula to determine the approximate centers in pitches for chain lengths in pitches already determined. Consult Union Chain Division for fixed center drives.

$$C = \frac{L - \frac{N+n}{2} + \sqrt{\left(L - \frac{N+n}{2}\right)^2 - 8\,\frac{(N-n)^2}{4-2}}}{4}$$

Where:

C = Shaft center distance in pitches.

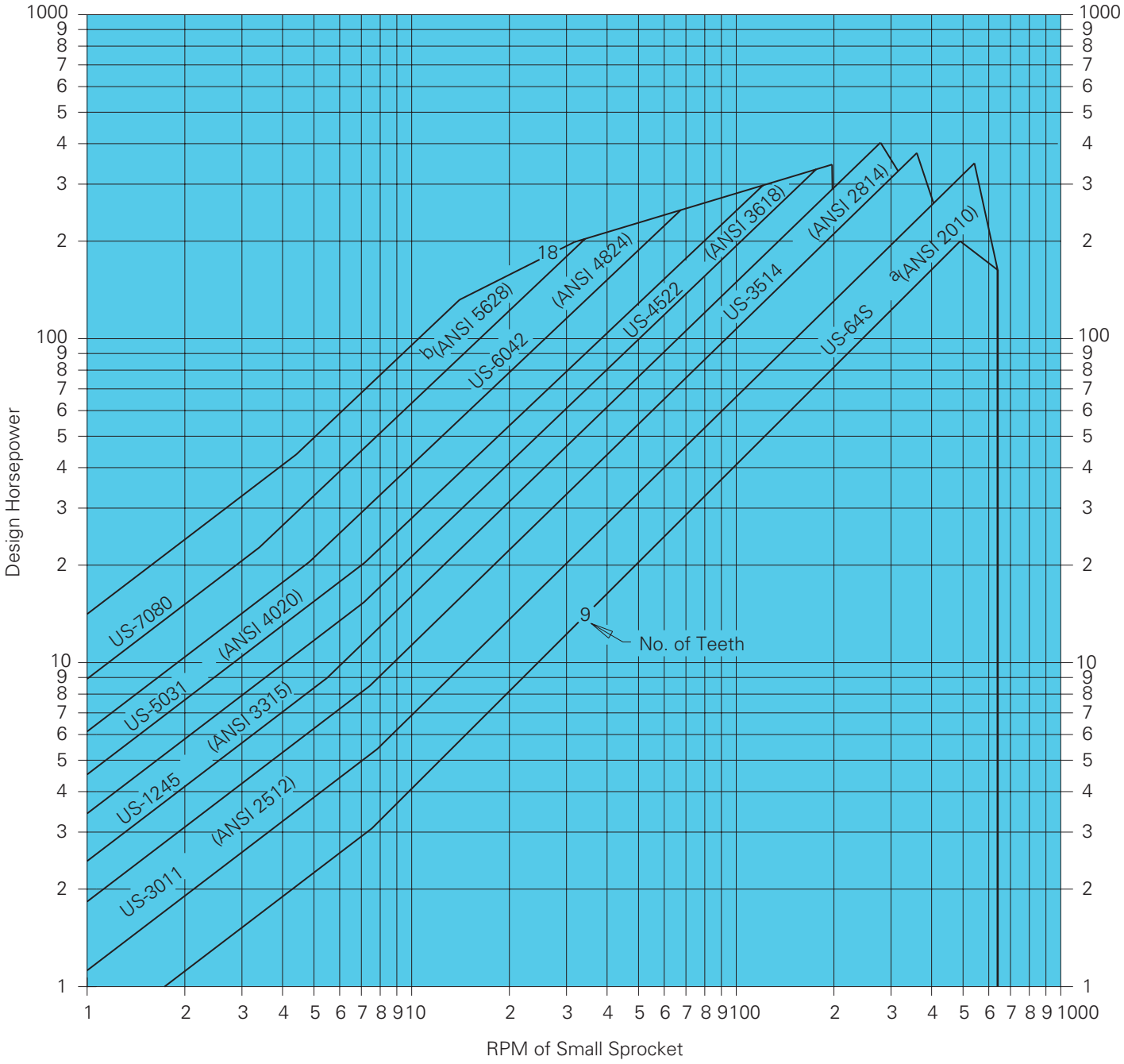
L = Length of chain in pitches.

N = Number of teeth in larger sprocket.

n = Number of teeth in smaller sprocket.

π = 3.1416.

Quick Selection Chart



a. This chain has straight sidebars. No. 2010 ANSI standard chain has been assigned. (US-64S does not run on 2010 (US-2570) sprockets.)

b. This chain has straight sidebars. No. 5628 ANSI standard chain has been assigned. (US-7080 does not run on 5628 (US-7060) sprockets.)

Lower line is for 9 tooth US-64S. Top line is for 18 tooth US-7080. Intermediate lines are approximate mid-points for sprocket tooth range shown in HP charts, pages A-11 ~ A-14. Where the horsepower-RPM intersection lands near a line, both chains on each side should be checked on the charts.

The horsepower ratings in the following pages apply to lubricated single strand Engineering Drive Chains operating on cut tooth sprockets.

Horsepower Ratings US-64S
Heavy Duty Straight Sidebar Power Transmission Chain **2.500" Pitch**

	Horsepower Capacity RPM													
Teeth	**2**	**3**	**7**	**10**	**20**	**30**	**40**	**100**	**200**	**250**	**350**	**450**	**600**	**700**
9	1.1	1.4	2.7	3.9	7.7	11.6	15.4	38.6	77.2	96.5	135.1	100.1	65.0	—
10	1.1	1.5	3.0	4.3	8.6	12.9	17.2	42.9	85.8	107.3	150.2	117.2	76.1	—
11	1.2	1.7	3.3	4.7	9.4	14.2	18.9	47.2	94.4	118.0	165.2	135.2	87.8	—
12	1.3	1.8	3.6	5.1	10.3	15.4	20.6	51.5	103.0	128.7	180.2	154.1	100.1	—
13	1.4	1.9	3.9	5.6	11.2	16.7	22.3	55.8	111.5	139.4	195.2	173.7	112.8	—
14	1.5	2.0	4.2	6.0	12.0	18.0	24.0	60.1	120.1	150.2	210.2	194.2	126.1	—
15	1.5	2.1	4.5	6.4	12.9	19.3	25.7	64.4	128.7	160.9	225.2	215.3	139.9	—
16	1.6	2.2	4.8	6.9	13.7	20.6	27.5	68.6	137.3	171.6	240.3	237.2	154.1	—
17	1.7	2.3	5.1	7.3	14.6	21.9	29.2	72.9	145.9	182.3	255.3	259.8	168.8	—
18	1.8	2.4	5.4	7.7	15.4	23.2	30.9	77.2	154.5	193.1	270.3	283.1	183.9	—
19	1.9	2.5	5.7	8.2	16.3	24.5	32.6	81.5	163.0	203.8	285.3	307.0	—	—
20	1.9	2.6	6.0	8.6	17.2	25.7	34.3	85.8	171.6	214.5	300.3	331.5	—	—
21	2.0	2.7	6.3	9.0	18.0	27.0	36.0	90.1	180.2	225.2	315.3	356.7	—	—
22	2.1	2.8	6.6	9.4	18.9	28.3	37.8	94.4	188.8	236.0	330.4	382.5	—	—
23	2.1	3.0	6.9	9.9	19.7	29.6	39.5	98.7	197.4	246.7	345.4	405.3	—	—
24	2.2	3.1	7.2	10.3	20.6	30.9	41.2	103.0	205.9	257.4	360.4	414.4	—	—
	Manual Lubrication						**Oil Bath**		**Oil Stream Lubrication**					

Horsepower Ratings US-3011
Heavy Duty Offset Sidebar Power Transmission Chain **3.067" Pitch**

	Horsepower Capacity RPM													
Teeth	**1**	**3**	**6**	**10**	**20**	**40**	**100**	**150**	**200**	**250**	**300**	**350**	**400**	**450**
9	1.0	2.4	4.0	6.4	12.7	25.5	63.7	95.6	127.4	159.3	191.1	171.8	140.6	—
10	1.1	2.6	4.3	7.1	14.2	28.3	70.8	106.2	141.6	177.0	212.4	198.9	164.7	—
11	1.2	2.7	4.7	7.8	15.6	31.1	77.9	116.8	155.7	194.7	231.3	215.5	190.0	—
12	1.3	2.9	5.1	8.5	17.0	34.0	85.0	127.4	169.9	212.4	248.6	231.5	216.5	—
13	1.4	3.1	5.5	9.2	18.4	36.8	92.0	138.0	184.1	230.1	265.3	247.0	232.3	—
14	1.4	3.3	5.9	9.9	19.8	39.6	99.1	148.7	198.2	247.8	281.4	262.1	246.4	—
15	1.5	3.5	6.4	10.6	21.2	42.5	106.2	159.3	212.4	265.5	296.9	276.6	260.0	—
16	1.6	3.7	6.8	11.3	22.7	45.3	113.3	169.9	226.5	283.2	312.0	290.6	273.2	—
17	1.7	3.8	7.2	12.0	24.1	48.1	120.3	180.5	240.7	300.9	326.5	304.1	285.9	—
18	1.7	4.0	7.6	12.7	25.5	51.0	127.4	191.1	245.9	318.6	340.5	317.1	—	—
19	1.8	4.2	8.1	13.5	26.9	53.8	134.5	201.8	269.0	336.3	354.0	329.7	—	—
20	1.9	4.3	8.5	14.2	28.3	56.6	141.6	212.4	283.2	354.0	367.1	341.9	—	—
21	1.9	4.5	8.9	14.9	29.7	59.5	148.7	233.0	297.3	371.7	379.6	353.6	—	—
22	2.0	4.7	9.3	15.6	31.1	62.3	155.7	233.6	311.5	389.4	391.7	364.8	—	—
23	2.1	4.9	9.8	16.3	32.6	65.1	162.8	244.2	325.6	407.1	403.4	375.7	—	—
24	2.2	5.1	10.2	17.0	34.0	68.0	169.9	254.9	339.8	424.8	414.6	386.1	—	—
	Manual Lubrication					**Oil Bath**		**Oil Stream Lubrication**						

For continuous operation in the highlighted area, some galling of the live bearing surfaces of the chain joints may be expected even though lubrication is as suggested.

The ratings shown on these charts are based on chain which operates over machine cut tooth sprockets.

Horsepower Ratings US-3514
Heavy Duty Offset Sidebar Power Transmission Chain **3.500" Pitch**

	Horsepower Capacity RPM													
Teeth	**1**	**3**	**6**	**10**	**20**	**35**	**80**	**100**	**125**	**150**	**200**	**250**	**300**	**325**
9	1.4	3.3	5.5	8.8	17.6	30.8	52.8	88.1	110.1	132.1	176.1	178.7	170.8	—
10	1.5	3.5	6.0	9.8	19.6	34.2	58.7	97.8	122.3	146.8	195.7	196.1	187.4	—
11	1.6	3.8	6.5	10.8	21.5	37.7	64.6	107.6	134.5	161.4	215.2	213.0	203.6	—
12	1.8	4.1	7.0	11.7	23.5	41.1	70.4	117.4	146.8	176.1	234.8	229.5	219.4	—
13	1.9	4.3	7.6	12.7	25.4	44.5	76.3	127.2	159.0	190.8	254.4	245.6	234.7	—
14	2.0	4.6	8.2	13.7	27.4	47.9	82.2	137.0	171.2	205.5	273.9	261.2	249.6	—
15	2.1	4.8	8.8	14.7	29.4	51.4	88.1	146.8	183.4	220.1	292.1	276.3	264.1	—
16	2.2	5.1	9.4	15.7	31.3	54.8	93.9	156.5	195.7	234.8	307.7	291.1	278.2	—
17	2.3	5.3	10.0	16.6	33.3	58.2	99.8	166.3	207.9	249.5	322.8	305.5	—	—
18	2.4	5.5	10.6	17.6	35.2	61.6	105.7	176.1	220.1	264.2	337.6	319.4	—	—
19	2.5	5.8	11.2	18.6	37.2	65.1	111.5	185.9	232.4	278.8	351.9	333.0	—	—
20	2.6	6.0	11.7	19.6	39.1	68.5	117.4	195.7	244.6	293.5	365.8	346.1	—	—
21	2.7	6.2	12.3	20.5	41.1	71.9	123.3	205.5	256.8	308.2	379.3	358.9	—	—
	Manual Lubrication						**Oil Bath**		**Oil Stream Lubrication**					

Horsepower Ratings US-1245
Heavy Duty Offset Sidebar Power Transmission Chain **4.073" Pitch**

	Horsepower Capacity RPM													
Teeth	**1**	**3**	**6**	**10**	**20**	**30**	**40**	**65**	**80**	**100**	**125**	**150**	**200**	**225**
9	2.0	4.7	8.0	12.8	25.5	38.3	51.1	83.0	102.1	127.7	159.6	168.2	166.3	—
10	2.2	5.1	8.7	14.2	28.4	42.6	56.7	92.2	113.5	141.8	177.3	185.0	182.9	—
11	2.4	5.5	9.4	15.6	31.2	46.8	62.4	101.4	124.8	156.0	195.0	201.5	199.2	—
12	2.5	5.9	10.2	17.0	34.0	51.1	68.1	110.6	136.2	170.2	212.8	217.6	215.1	—
13	2.7	6.3	11.1	18.4	36.9	55.3	73.8	119.9	147.5	184.4	230.5	233.4	230.7	—
14	2.9	6.6	11.9	19.9	39.7	59.6	79.4	129.1	158.9	198.6	248.2	248.8	246.0	—
15	3.0	7.0	12.8	21.3	42.6	63.8	85.1	138.3	170.2	212.8	265.9	263.9	261.0	—
16	3.2	7.3	13.6	22.7	45.4	68.1	90.8	147.5	181.6	227.0	280.7	278.7	275.6	—
17	3.3	7.7	14.5	24.1	48.2	72.3	96.5	156.7	192.9	241.1	295.3	293.2	289.9	—
18	3.5	8.0	15.3	25.5	51.1	76.6	102.1	166.0	204.3	255.3	309.6	307.3	303.9	—
19	3.6	8.4	16.2	27.0	53.9	80.9	107.8	175.2	215.6	269.5	323.5	321.2	317.6	—
20	3.8	8.7	17.0	28.4	56.7	85.1	113.5	184.4	227.0	283.7	337.1	334.7	—	—
21	3.9	9.0	17.9	29.8	59.6	89.4	119.2	193.6	238.3	297.9	350.5	347.9	—	—
	Manual Lubrication						**Oil Bath**			**Oil Stream Lubrication**				

For continuous operation in the highlighted area, some galling of the live bearing surfaces of the chain joints may be expected even though lubrication is as suggested.

The ratings shown on these charts are based on chain which operates over machine cut tooth sprockets.

Horsepower Ratings US-4522
Heavy Duty Offset Sidebar Power Transmission Chain **4.500" Pitch**

	Horsepower Capacity RPM													
Teeth	**1**	**3**	**6**	**10**	**20**	**30**	**35**	**50**	**65**	**80**	**100**	**125**	**150**	**175**
9	2.6	6.0	10.2	16.3	32.6	48.9	57.0	81.5	105.9	130.4	153.8	156.6	158.8	—
10	2.8	6.5	11.1	18.1	36.2	54.3	63.4	90.5	117.7	144.9	169.5	172.5	175.0	—
11	3.0	7.0	12.0	19.9	39.8	59.8	69.7	99.6	129.5	159.4	184.8	188.1	190.8	—
12	3.3	7.5	13.0	21.7	43.5	65.2	76.1	108.7	141.3	173.9	199.8	203.4	206.3	—
13	3.5	8.0	14.1	23.5	47.1	70.6	82.4	117.7	153.0	188.3	214.6	218.4	221.6	—
14	3.7	8.5	15.2	25.4	50.7	76.1	88.7	126.8	164.8	202.8	229.1	233.2	236.6	—
15	3.9	8.9	16.3	27.2	54.3	81.5	95.1	135.8	176.6	217.3	243.4	247.7	251.3	—
16	4.1	9.4	17.4	29.0	58.0	86.9	101.4	144.9	188.3	231.8	257.4	261.9	265.7	—
17	4.2	9.8	18.5	30.8	61.6	92.4	107.8	153.9	200.1	246.3	271.1	275.9	279.9	—
18	4.4	10.2	19.6	32.6	65.2	97.8	114.1	163.0	211.9	260.8	284.6	289.6	293.8	—
19	4.6	10.7	20.6	34.4	68.8	103.2	120.4	172.0	223.7	275.3	297.8	303.1	307.5	—
20	4.8	11.1	21.7	36.2	72.4	108.7	126.8	181.1	235.4	289.8	310.7	316.3	320.9	—
21	5.0	11.5	22.8	38.0	76.1	114.1	133.1	190.1	247.2	304.2	323.5	329.2	334.0	—
	Manual Lubrication						**Oil Bath**			**Oil Stream Lubrication**				

Horsepower Ratings US-5031
Heavy Duty Offset Sidebar Power Transmission Chain **5.000" Pitch**

	Horsepower Capacity RPM													
Teeth	**.5**	**1**	**3**	**6**	**10**	**20**	**30**	**35**	**50**	**65**	**80**	**100**	**125**	**130**
9	2.0	3.4	7.8	13.3	21.1	42.2	63.3	73.8	105.5	133.9	139.3	145.3	151.6	—
10	2.2	3.7	8.5	14.4	23.4	46.9	70.3	82.0	117.2	147.6	153.6	160.2	—	—
11	2.3	3.9	9.1	15.5	25.8	51.6	77.4	90.3	128.9	161.2	167.7	174.9	—	—
12	2.5	4.2	9.7	16.9	28.1	56.3	84.4	98.5	140.7	174.5	181.6	189.4	—	—
13	2.6	4.5	10.3	18.3	30.5	61.0	91.4	106.7	152.4	187.7	195.2	203.7	—	—
14	2.8	4.7	10.9	19.7	32.8	65.6	98.5	114.9	164.1	200.6	208.7	217.7	—	—
15	2.9	5.0	11.5	21.1	35.2	70.3	105.5	123.1	175.8	213.4	222.0	231.6	—	—
16	3.1	5.2	12.1	22.5	37.5	75.0	112.5	131.3	187.5	225.9	235.0	245.2	—	—
17	3.2	5.5	12.7	23.9	39.9	79.7	119.6	139.5	199.3	238.2	247.8	258.6	—	—
18	3.4	5.7	13.3	25.3	42.2	84.4	126.6	147.7	211.0	250.4	260.5	271.7	—	—
	Manual Lubrication							**Oil Bath**		**Oil Stream Lubrication**				

For continuous operation in the highlighted area, some galling of the live bearing surfaces of the chain joints may be expected even though lubrication is as suggested.

The ratings shown on these charts are based on chain which operates over machine cut tooth sprockets.

Horsepower Ratings US-6042
Heavy Duty Offset Sidebar Power Transmission Chain **6.000" Pitch**

	Horsepower Capacity RPM													
Teeth	**.5**	**1**	**3**	**6**	**10**	**20**	**30**	**35**	**40**	**45**	**50**	**60**	**70**	**75**
9	3.1	5.3	12.2	20.7	33.0	66.0	96.1	101.5	106.3	110.8	115.0	122.6	129.0	—
10	3.4	5.7	13.2	22.4	36.6	73.3	106.2	112.1	117.5	122.5	127.1	135.5	—	—
11	3.6	6.2	14.2	24.2	40.3	80.6	116.1	122.6	128.5	133.9	139.0	148.2	—	—
12	3.9	6.6	15.2	26.4	44.0	87.9	126.0	133.0	139.4	145.3	150.8	160.8	—	—
13	4.1	7.0	16.2	28.6	47.6	95.3	135.7	143.2	150.1	156.5	162.4	173.2	—	—
14	4.4	7.4	17.1	30.8	51.3	102.6	145.3	153.4	160.8	167.6	173.9	185.4	—	—
15	4.6	7.8	18.0	33.0	55.0	109.9	154.8	163.4	171.3	178.5	185.3	197.5	—	—
16	4.8	8.2	18.9	35.2	58.6	177.3	164.2	173.3	181.6	189.3	196.5	209.5	—	—
17	5.1	8.6	19.8	37.4	62.3	124.6	173.4	183.1	191.9	200.0	207.6	221.3	—	—
18	5.3	9.0	20.7	39.6	66.0	131.9	182.6	192.7	202.0	210.6	218.5	233.0	—	—
	Manual Lubrication									**Oil Bath**		**Oil Stream Lubrication**		

Horsepower Ratings US-7080
Heavy Duty Offset Sidebar Power Transmission Chain **7.000" Pitch**

	Horsepower Capacity RPM													
Teeth	**.1**	**.5**	**1**	**2**	**4**	**6**	**10**	**15**	**20**	**25**	**30**	**35**	**40**	**45**
9	1.3	4.6	7.7	13.1	22.2	30.2	48.1	67.1	76.7	85.0	92.5	99.4	105.7	—
10	1.4	4.9	8.4	14.2	24.0	32.7	53.5	74.2	84.8	94.0	102.3	109.9	—	—
11	1.6	5.3	9.0	15.2	25.9	35.3	58.8	81.2	92.8	103.0	112.0	120.3	—	—
12	1.7	5.7	9.6	16.3	27.6	38.5	64.2	88.2	100.8	111.8	121.7	130.7	—	—
13	1.8	6.0	10.2	17.3	29.4	41.7	69.5	95.1	108.7	120.6	131.2	140.9	—	—
14	1.9	6.4	10.8	18.3	31.1	44.9	74.8	102.0	116.5	129.2	140.6	151.1	—	—
15	2.0	6.7	11.4	19.3	32.7	48.1	80.2	108.8	124.3	137.8	150.0	161.1	—	—
16	2.1	7.1	12.0	20.3	34.4	51.3	85.5	115.5	132.0	146.4	159.3	171.1	—	—
17	2.2	7.4	12.5	21.2	36.4	54.5	90.9	122.2	139.6	154.8	168.5	180.9	—	—
18	2.3	7.7	13.1	22.2	38.5	57.7	96.2	128.8	147.1	163.2	177.5	190.7	—	—
	Manual Lubrication													

For continuous operation in the highlighted area, some galling of the live bearing surfaces of the chain joints may be expected even though lubrication is as suggested.

The ratings shown on these charts are based on chain which operates over machine cut tooth sprockets.

Standard Selection Procedure Example

Engineering Class Drive Chain From Reducer to Apron Feeder Head Shaft

Select the proper Engineering Drive Chain to transmit power from a reducer to an apron feeder head shaft. The input power will be a 25 HP electric motor. The reducer output RPM will be 15 RPM and the head shaft RPM will be 5 RPM. Reducer shaft is 2 15/16" diameter. Head shaft is 3 15/16" diameter. The shaft centers should be minimum suggested.

Step 1: Determine Class of Driven Load

From Table 1 (Application Classifications), the load class for an apron feeder is M, representing moderate shock. (See Feeders, Apron.)

Step 2: Select Service Factor

From Table 2 (Service Factors), for electric motor and moderate shock is 1.3.

Step 3: Calculate Design Horsepower

Design horsepower equals the horsepower transmitted x service factor of 25 x 1.3 = 32.5.

Step 4: Select Chain Pitch

- From the Engineering Drive Chain Quick Selection Chart locate the vertical axis 32.5 design horsepower.
- Locate on the horizontal axis 15 RPM of the small sprocket.
- The intersection of the 32.5 design horsepower and 15 RPM of the small sprocket lines intersect in the area designating 4.5" pitch US-4522 Engineering Drive Chain as the appropriate selection.

Step 5: Select Number of Teeth in Small Sprocket

Interpolating the US-4522 rating table for 15 RPM, a 12-tooth sprocket will transmit 32.6 HP. Hardened teeth suggested. Required lubrication is Type I, manual.

Step 6: Determine Number of Teeth in Large Sprocket

$$\text{Number of teeth in large sprocket} = \frac{15 \times 12}{5} = 36$$

Step 7: Determine Suggested Minimum Center Distance

Approximate minimum center distance =

$$\frac{2\,(36) + 12}{6} = \frac{84}{6} = 14 \text{ Pitches}$$

Step 8: Check Final Drive Design

Check the final drive design.

Step 9: Specify Sprockets

12-Tooth Sprocket for US-4522 Chain. Hardened Steel, Type C Hub, 2 15/16" Diameter Bore, 3/4" x 3/8" KW, and 5/8" SS.

36 Tooth Sprocket for US-4522 Chain. Steel Type C Hub, 3 15/16" Diameter Bore, 1" x 1/2" KW, and 5/8" SS.

Step 10: Calculate Chain Length

$$\text{Chain length} = \frac{S}{2} + 2C + \frac{K}{C}$$

$$= \frac{36 + 12}{2} + 2\,(14) + \frac{14.6}{14}$$

$$= 24 + 28 + 1 = 53 \text{ Pitches}$$

Where:

$S = N + n$

C = Shaft center distance in pitches

K = Constant from Table 3, (page A-8)