Roller Conveyor Chains

Reliable Performance for Your Operation

Protect your in-plant processes with high-quality Roller Conveyor Chain from Union. Union Chain is an expert in the manufacture of specialized conveyors and chain for all major industries.

Performance Is Built In

Union Roller Conveyor Chain is backed by innovative engineering. Every step in the process is designed to deliver long-lasting Conveyor Chain for your application. You get better performance and longer service life from Union.

High-Quality Materials

The steels used to make Union Roller Conveyor Chain are selected for optimum wear and performance. They are manufactured to fine grain practice to ensure greater strength and toughness. We use premium grades of carbon steels on heat-treated and non-heat-treated chains. That means high strength for long-term, reliable performance at your operation.

Precision Manufacturing

Union uses sophisticated tooling to maximize precision. Our modern press tools pierce and then broach the holes in the sidebars to provide the best bearing area between the pin and sidebar. This careful attention to detail means longer wear life and greater fatigue strength.

Exacting Assembly

Extreme force is required to set the round parts in sidebars to produce a high interference fit. Union has developed special, high-speed equipment to ensure accurate assembly.

Count on Union to Deliver High-Quality Chain Quickly.

Stock Chain Items

Union conducted a survey of the marketplace and identified the most commonly used chains. We stock a large inventory of these chains—the largest in the industry. That means you get the chain you need faster than ever before.

Stock Chain Numbers

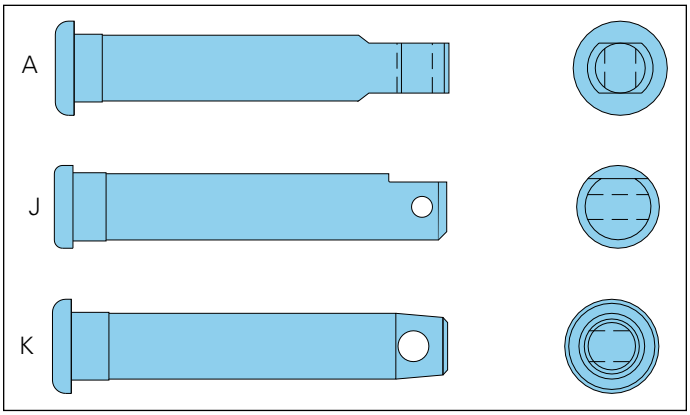
- 53R
- 95R
- 94R
- US-90R
- 89R
- US-196R
- 604R
- 607R
- 627R
- 614R

Roller Conveyor Components

Strong, Long-Lasting Pins

Pins for Union Conveyor Chains are produced from carbon or alloy steel to stand up to the most rugged conditions. Each is produced with the utmost care to ensure proper fit in the sidebars and a smooth bearing surface. Pins are available in through-hardened, case-hardened, and induction-hardened steel to extend the service life even more.

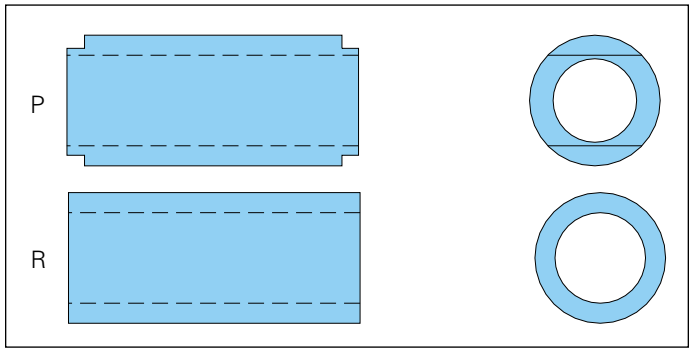
Pin Styles



Smooth Bushings

Bushings are usually produced from carbon or alloy steels, then carburized and case hardened. This heat-treatment, using computer-controlled furnaces, produces high surface hardness for excellent wear with a tough core. Dimensions are carefully controlled to provide a uniform bearing surface and precise fit into the sidebars. Stainless steel bushings are available.

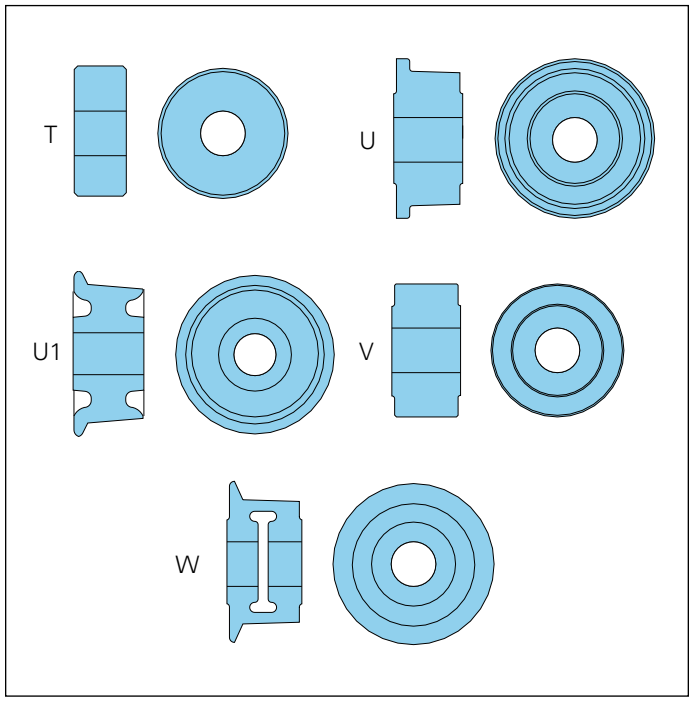
Bushing Styles



Reliable Rollers

Union offers a variety of steel grades and heat treatments for rollers. Our standard rollers are fabricated using carbon and alloy steels that are carburized and case hardened. They are heat-treated in computer-controlled furnaces to produce a hard bearing surface with a ductile core. Rollers are also available in stainless steels, various plastics, including Delrin and UHMW, and with plastic inserted sleeves on the rollers.

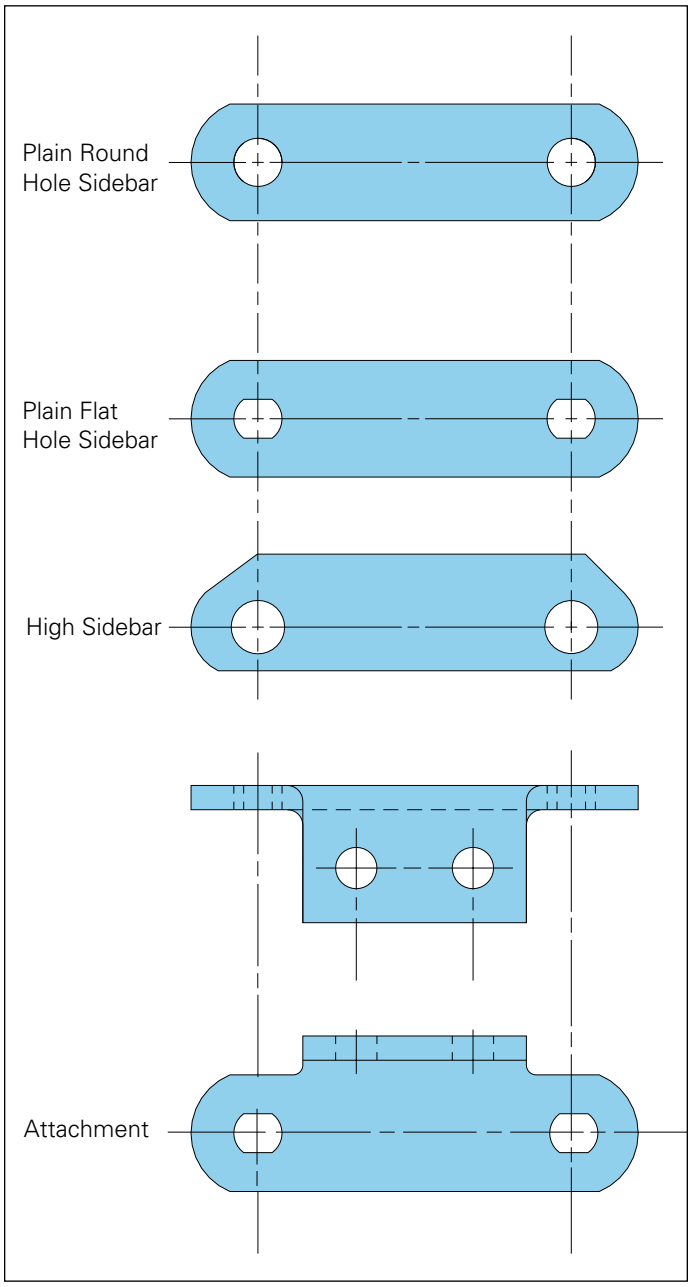
Roller Styles



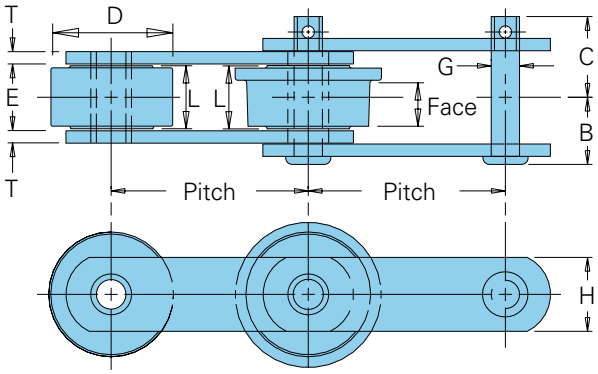
Precision Manufactured Sidebars

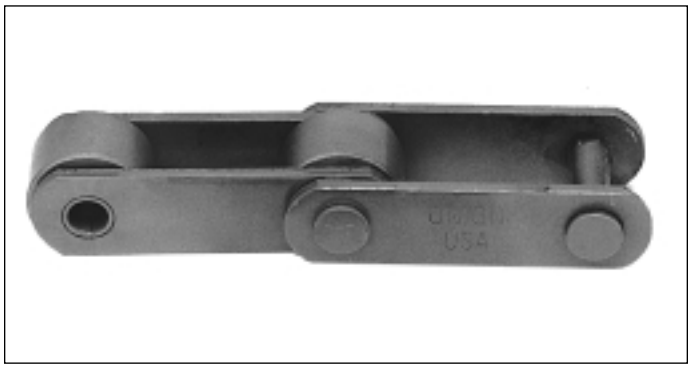
Standard sidebars are made from special grades of carbon or alloy steels to provide tough, long-lasting performance. Stainless steel sidebars are also available for corrosive and high-temperature environments. Pitch and hole size is carefully controlled to enable the chain to fit precisely with sprockets. This provides proper articulation, extending the life of the chain and the sprockets. Look for the "RX" suffix, which indicates heat-treated sidebars. That means even greater strength and toughness. Also, a wide variety of attachments are available.

Sidebar Styles



Roller Conveyor Plain Chain





Roller Conveyor Chain Specifications

All dimensions are in inches unless otherwise indicated.

Chain No.	Pitch	Width			Roller					Pin			Sidebar			Bushing	Bearing Area (in²)	Avg. Ult. Stgth. (lbs.)	Max. Work Load (lbs.)	Approx. Wgt. (lbs./ft.)
		Pin Head to CL	Pin End to CL	Inside	Dia.	Lgth.	Sty.[1]	Matl.[2]	Face Width	Dia.	Sty.[1]	Matl.[2]	Hgt.	Th.	Matl.[2]	Matl.[2]				
		B	C	E	D	L				G			H	T						
378R	1.654	1.03	1.25	1.00	.88	.97	T	AHT		.44	A	CHT	1.13	.19	HC	ACH	.61	13,000	2,100	3.7
378RX	1.654	1.03	1.25	1.00	.88	.97	T	AHT		.44	A	CHT	1.13	.19	CHT	ACH	.60	20,000	2,100	3.7
US-278R	2.609	1.13	1.31	1.13	.88	1.09	T	AHT		.44	J	CHT	1.13	.19	HC	CCH	.66	13,000	2,300	3.0
81X	2.609	.91	1.16	1.06	.91	1.00	T	CCH		.44	K	CCH	1.13	.16	CHT	CCH	.61	15,000	2,150	2.5
87R	2.609	1.20	1.45	1.13	.88	1.06	T	AHT		.44	A	CHT	1.13	.25	HC	CCH	.72	18,000	2,500	3.8
53R	3.000	1.03	1.25	1.00	1.50	.97	T	PMHT		.44	A	CHT	1.13	.19	CRS	ACH	.61	13,000	2,100	3.9
93R	3.000	1.28	1.47	1.25	1.50	1.19	T	CCH		.50	A	CHT	1.25	.25	HC	ACH	.88	20,000	3,000	4.8
119R	3.075	1.59	1.84	1.50	1.25	1.44	T	AHT		.63	A	ACH	1.50	.31	HC	ACH	1.34	28,000	4,600	6.8
119RX	3.075	1.59	1.84	1.50	1.25	1.44	T	AHT		.63	A	ACH	1.50	.31	CHT	ACH	1.34	48,000	4,600	6.8
95R	4.000	1.03	1.25	1.00	1.50	.97	T	PMHT		.44	A	CHT	1.13	.19	CRS	ACH	.61	13,000	2,100	3.4
1188R	4.000	1.13	1.28	1.13	1.75	1.06	T	CRS		.44	A	ACH	1.13	.19	CRS	CCH	.66	13,000	2,100	3.3
94R	4.000	1.11	1.30	.88	1.50	.81	T	PMHT		.50	A	CHT	1.25	.25	CRS	ACH	.61	19,000	2,400	4.1
97R	4.000	1.11	1.30	.88	1.75	.81	T	PMHT		.50	A	CHT	1.25	.25	CRS	ACH	.61	19,000	2,400	4.5
US-90R	4.000	1.11	1.33	1.19	2.00	1.13	T	CCH		.44	A	CHT	1.25	.19	HC	ACH	.69	16,500	2,400	5.3
83R	4.000	1.38	1.63	1.31	2.00	1.25	T	CCH		.63	A	CHT	1.50	.25	HC	CCH	1.14	22,000	3,650	6.6
91R	4.000	1.50	1.75	1.31	1.75	1.25	T	CRS		.63	A	CHT	1.50	.31	HC	ACH	1.11	28,000	4,100	7.0
89R	4.000	1.59	1.88	1.31	2.25	1.25	T	CCH		.63	A	CHT	1.50	.38	HC	CCH	1.10	28,000	4,500	10.6
84R	4.000	2.08	2.44	2.31	2.25	2.25	T	CCH		.63	A	CHT	1.50	.38	HC	ACH	1.93	28,000	4,700	13.5
1113R	4.040	1.50	1.75	1.31	2.00	1.25	T	CCH		.63	A	CHT	1.50	.31	HC	ACH	1.09	26,000	4,250	7.4
50001	5.000	1.48	1.68	1.19	2.25	1.16	T	CCH		.63	A	ACH	1.50	.31	CHT	ACH	1.01	45,000	3,960	7.1
6053R	6.000	1.03	1.25	1.00	1.50	.97	T	PMHT		.44	A	CHT	1.13	.19	HC	ACH	.61	13,000	2,100	3.1
US-196R	6.000	1.20	1.45	1.13	2.00	1.06	T	CCH		.44	A	CHT	1.25	.25	HC	CCH	.72	18,000	2,500	5.0
604R	6.000	1.33	1.58	1.31	2.00	1.25	T	CCH		.56	A	CHT	1.50	.25	HC	ACH	1.01	21,000	3,500	5.4
607R	6.000	1.33	1.58	1.31	2.50	1.25	T	CCH		.56	A	CHT	1.50	.25	HC	ACH	1.01	21,000	3,500	6.5
603R	6.000	1.33	1.58	1.31	2.50	1.25	U	AIHT	.88	.56	A	CHT	1.50	.25	HC	ACH	1.01	21,000	3,500	5.5
86R	6.000	1.38	1.63	1.31	2.00	1.25	V	AIHT		.63	A	CHT	1.50	.25	HC	CCH	1.14	22,000	3,600	5.4
1604[3]	6.000	1.22	1.44	1.06	3.00	.88	T	CCH		.50	A	ACH	1.25	.25	CHT	CCH	.78	24,000	2,750	5.4
625R	6.000	1.56	1.81	1.69	3.00	1.63	U	AIHT	1.13	.63	A	CHT	2.00	.25	HC	CCH	1.38	25,000	4,750	9.8
627R	6.000	1.47	1.75	1.31	2.00	1.25	T	CCH		.63	A	CHT	1.50	.31	HC	ACH	1.22	26,000	4,250	6.6
629R	6.000	1.59	1.84	1.50	3.00	1.44	V	CCH	1.31	.63	A	ACH	1.50	.31	HC	ACH	1.30	26,000	4,650	9.7
628R	6.000	1.59	1.88	1.31	2.25	1.25	T	CRS		.63	A	ACH	1.75	.38	HC	CCH	1.11	28,000	4,500	8.7

Dimensions shown are nominal. Obtain certified prints for design and construction.

Indicates this chain is normally stocked. All others are made-to-order.

[1]Styles for rollers, pins, sidebars and bushings are shown on pages A-17 ~ A-18.

[2]Material: CHT = Carbon heat-treated; CCH = Carbon case hardened; AHT = Alloy heat-treated; CRS = Cold rolled steel; AIHT = Alloy iron heat-treated; ACH = Alloy case hardened; HC = High carbon; PMHT = Powdered metal heat-treated.

[3]Offset sidebar.

[4]CC5 is only provided in high sidebar design.

To locate compatible sprockets for your chain, refer to the Product Cross-Reference in Section D.

Note: Dimensions are subject to change. Contact Union Chain to obtain certified prints for design and construction.

Roller Conveyor Specifications (Continued)

All dimensions are in inches unless otherwise indicated.

Chain No.	Pitch	Width			Roller					Pin			Sidebar			Bushing	Bearing Area (in.²)	Avg. Ult. Stgth. (lbs.)	Max. Work Load (lbs.)	Approx. Wgt. (lbs./ft.)
		Pin Head to CL	Pin End to CL	Inside	Dia.	Lgth.	Sty.[1]	Matl.[2]	Face Width	Dia.	Sty.[1]	Matl.[2]	Hgt.	Th.	Matl.[2]	Matl.[2]				
		B	C	E	D	L				G			H	T						
626R	6.000	1.59	1.88	1.31	3.00	1.25	V	CCH	1.13	.63	A	ACH	2.00	.38	HC	CCH	1.10	28,000	4,500	10.7
60001	6.000	1.39	1.68	1.19	2.50	1.16	T	CCH		.63	A	ACH	1.50	.31	CHT	ACH	1.01	45,000	3,960	7.4
1126R[3]	6.000	1.59	1.91	1.31	2.25	1.25	T	CRS		.63	A	ACH	1.50	.38	HC	CCH	1.10	28,000	4,500	8.0
1126RS[3]	6.000	1.59	1.91	1.31	3.00	1.25	T	CCH		.63	A	ACH	1.50	.38	HC	CCH	1.10	28,000	4,500	10.0
2130R[3]	6.000	1.72	2.00	1.31	2.50	1.25	T	CCH		.75	A	ACH	2.00	.38	HC	CCH	1.55	38,000	5,250	11.0
631R	6.000	1.63	2.03	1.38	3.00	1.31	T	CCH		.75	A	CHT	2.00	.38	HC	CCH	1.61	38,000	5,600	12.2
614R	6.000	1.63	2.03	1.38	2.50	1.31	T	CCH		.75	A	CHT	2.00	.38	HC	CCH	1.48	38,000	5,600	11.0
B-663R	6.000	1.94	2.38	2.00	3.00	1.94	U	AIHT	1.50	.75	A	CHT	2.00	.38	HC	ACH	2.07	41,000	7,200	14.0
1630R[3]	6.000	1.66	2.03	1.38	2.50	1.31	T	CCH		.88	A	ACH	2.00	.38	HC	ACH	1.66	43,000	6,500	11.0
2184R[3]	6.000	1.66	2.03	1.38	3.00	1.31	V	PMHT	1.18	.88	J	ACH	2.00	.38	HC	ACH	1.66	43,000	6,500	12.3
2184RX[3]	6.000	1.66	2.03	1.38	3.00	1.31	V	PMHT	1.18	.88	J	ACH	2.00	.38	CHT	ACH	1.66	75,000	6,500	12.0
CC5[4]	6.000	1.50	1.69	1.38	2.50	1.31	T	CCH		.69	A	CCH	2.50	.31	HC	CCH	1.38	50,000	4,800	11.0
610R	6.000	1.78	2.19	1.69	2.75	1.63	T	CCH		.88	A	ACH	2.25	.38	HC	CCH	2.16	45,000	7,450	13.5
96R	6.000	1.69	2.09	1.50	2.75	1.44	T	CCH		.75	A	ACH	2.00	.38	HC	ACH	1.61	47,000	5,900	11.8
1131R	6.000	1.69	2.09	1.50	3.00	1.44	T	CCH		.75	A	ACH	2.00	.38	HC	ACH	1.61	47,000	5,900	12.5
96RX	6.000	1.69	2.09	1.50	2.75	1.44	T	CCH		.75	A	ACH	2.00	.38	CHT	ACH	1.61	70,000	5,900	11.8
2198RX	6.000	1.97	2.38	1.50	2.75	1.44	V	CCH	1.31	.88	A	AHT	2.25	.50	CHT	ACH	1.80	100,000	7,700	15.3
2178RX	6.000	1.72	2.09	1.50	2.75	1.44	V	CCH	1.31	.88	A	AHT	2.25	.38	CHT	ACH	2.00	85,000	6,900	13.1
800RX	8.000	2.19	2.63	1.81	3.50	1.75	V	CCH	1.63	1.00	K	ACH	3.00	.50	CHT	ACH	2.81	125,000	9,800	22.5
806R	8.000	2.22	2.63	1.81	3.00	1.75	T	CCH		1.00	K	AHT	2.50	.50	CHT	CCH	2.81	95,000	9,800	22.5
896R	8.000	1.69	2.09	1.50	3.50	1.44	V	CCH	1.31	.75	A	ACH	2.00	.38	HC	ACH	1.70	47,000	5,900	14.3
925R	9.000	1.56	1.84	1.69	3.00	1.63	U	AIHT	1.13	.63	A	CHT	2.00	.25	HC	CCH	1.38	25,000	4,150	8.2
B-912R	9.000	1.59	1.88	1.50	3.00	1.44	V	CCH	1.38	.63	A	ACH	2.00	.31	HC	ACH	1.34	47,000	4,650	8.6
B-963R	9.000	1.94	2.34	2.00	3.50	1.94	U	AIHT	1.25	.75	A	CHT	2.00	.38	HC	ACH	2.07	41,000	7,200	13.0
D-963R	9.000	1.94	2.34	2.00	3.50	1.94	V	CCH	1.81	.75	A	CHT	2.00	.38	HC	ACH	2.07	41,000	7,200	13.0
E-963R	9.000	1.94	2.34	2.00	4.00	1.94	W	AIHT	1.25	.75	A	CHT	2.00	.38	HC	ACH	2.07	41,000	7,200	14.0
961R[3]	9.000	2.25	2.69	1.91	1.75	1.91	T	AHT		.88	A	ACH	2.25	.50	HC	CCH	2.56	60,000	9,000	10.0
4004	9.000	2.63	3.03	2.63	3.00	2.56	T	CCH		1.00	K	AHTIH	2.50	.50	HC	ACH	3.63	75,000	12,700	18.0
973R	9.000	2.59	3.06	2.63	5.00	2.56	U1	AIHT	1.75	1.00	K	AHT	2.50	.50	HC	ACH	3.63	75,000	12,700	23.6
B-964R	9.000	2.09	2.47	2.25	4.00	2.19	W	AIHT	1.50	.88	J	CHT	2.50	.38	HC	ACH	2.65	70,000	9,200	17.0
965R	9.000	2.09	2.47	2.25	3.00	2.19	V	CCH	2.06	.88	J	CHT	2.50	.38	HC	ACH	2.65	70,000	9,200	16.5
4009	9.000	2.06	2.50	2.19	3.00	2.13	T	CCH		.88	K	AIH	2.50	.38	AHT	ACH	2.60	67,000	9,200	13.0
4065	9.000	3.06	3.38	3.06	4.25	3.00	V	CCH	2.88	1.25	K	AIH	3.50	.63	HC	CCH	5.40	148,000	18,900	35.7
B-1212R	12.000	1.59	1.88	1.50	3.00	1.44	V	CCH	1.38	.63	A	ACH	2.00	.31	HC	ACH	1.34	41,000	4,650	7.5
B-1263R	12.000	1.94	2.34	2.00	3.50	1.94	U	AIHT	1.25	.75	A	CHT	2.00	.38	HC	CCH	2.07	41,000	7,200	11.0
D-1263R	12.000	1.94	2.34	2.00	3.50	1.94	V	CCH	1.81	.75	A	CHT	2.00	.38	HC	ACH	2.07	41,000	7,200	11.0
E-1263R	12.000	1.94	2.34	2.00	4.00	1.94	W	AIHT	1.25	.75	A	CHT	2.00	.38	HC	ACH	2.07	41,000	7,200	12.0
B-1266R	12.000	1.88	2.16	1.63	3.25	1.56	V	CCH	1.38	.75	A	CHT	2.00	.38	HC	CCH	1.79	41,000	6,300	9.5
1276R	12.000	1.94	2.22	2.00	4.00	1.94	U	AIHT	1.25	.75	A	CHT	2.50	.31	HC	CCH	1.97	41,000	7,200	12.0
1273R	12.000	2.59	3.06	2.63	5.00	2.56	U1	AIHT	1.75	1.00	K	CHT	2.50	.50	HC	ACH	3.63	75,000	12,700	21.5
B-1264R	12.000	2.09	2.47	2.25	4.00	2.19	W	AIHT	1.50	.88	J	CHT	2.50	.38	HC	ACH	2.65	70,000	9,200	15.0
1265R	12.000	2.09	2.47	2.25	3.00	2.19	V	CCH	2.06	.88	J	CHT	2.50	.38	HC	ACH	2.65	70,000	10,000	12.7
1271R	12.000	2.66	3.06	2.75	5.00	2.69	W	AIHT	1.75	1.25	K	AHT	3.00	.50	HC	CCH	4.69	100,000	16,400	27.0
B-1863R	18.000	1.94	2.34	2.00	3.50	1.94	V	AIHT	1.81	.75	A	CHT	2.00	.38	HC	ACH	2.07	41,000	7,200	9.5
D-1863R	18.000	1.94	2.34	2.00	3.50	1.94	U	AIHT	1.25	.75	A	CHT	2.00	.38	HC	ACH	2.07	41,000	7,200	9.5
F-1863R	18.000	1.94	2.34	2.00	4.00	1.94	U1	AIHT	1.25	.75	A	CHT	2.00	.38	HC	ACH	2.07	41,000	7,200	10.0
B-1864R	18.000	2.09	2.47	2.25	4.00	2.19	W	AIHT	1.50	.88	J	CHT	2.50	.38	HC	ACH	2.65	70,000	9,200	12.0
G-1864R	18.000	2.09	2.47	2.25	4.00	2.19	V	CCH	2.00	.88	J	CHT	2.50	.38	HC	ACH	2.65	70,000	9,200	11.0
1873R	18.000	2.59	3.06	2.63	5.00	2.56	U1	AIHT	1.75	1.00	K	AHT	2.50	.50	HC	ACH	3.63	75,000	12,700	17.0
1871R	18.000	2.66	3.06	2.75	5.00	2.69	W	AIHT	1.75	1.25	K	AHT	3.00	.50	HC	ACH	4.69	100,000	16,400	21.0
1866R	18.000	3.03	3.47	2.75	6.00	2.69	U1	AIHT	1.88	1.25	K	CCH	3.00	.63	HC	CCH	5.01	115,000	17,500	26.5
1867R	18.000	3.28	3.59	3.00	6.00	2.94	U1	AIHT	1.88	1.50	K	CCH	3.50	.63	HC	CCH	6.39	150,000	22,300	31.5

Dimensions shown are nominal. Obtain certified prints for design and construction.

Indicates this chain is normally stocked. All others are made-to-order.

[1]Styles for rollers, pins, sidebars, and bushings are shown on pages A-17 ~ A-18.

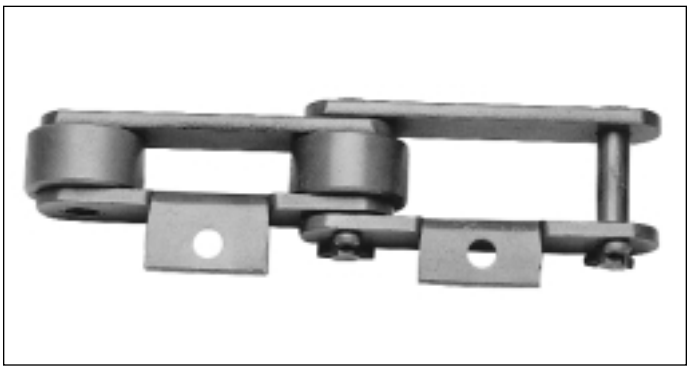
[2]Material: CHT = Carbon heat-treated; CCH = Carbon case hardened; AHT = Alloy heat-treated; CRS = Cold rolled steel; AIHT = Alloy iron heat-treated; ACH = Alloy case hardened; HC = High carbon; PMHT = Powdered metal heat-treated.

[3]Offset sidebar.

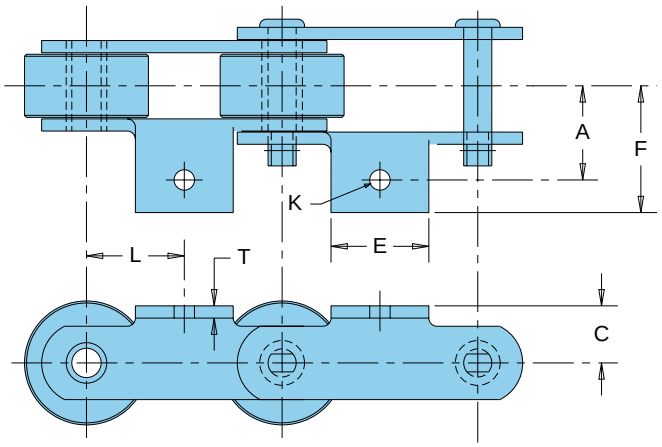
[4]CC5 is only provided in high sidebar design.

To locate compatible sprockets for your chain, refer to the Product Cross-Reference in Section D.

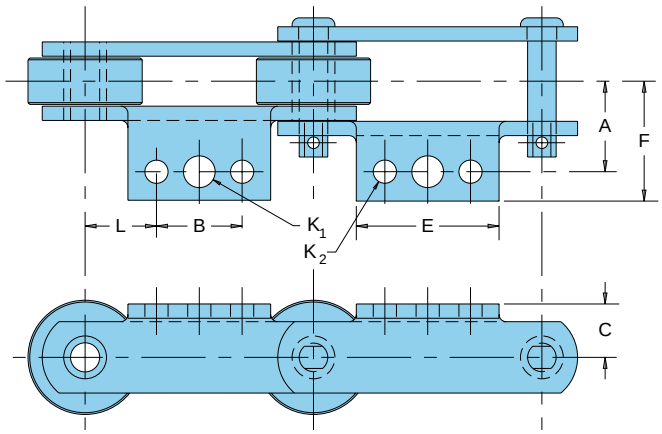
Note: Dimensions are subject to change. Contact Union Chain to obtain certified prints for design and construction.



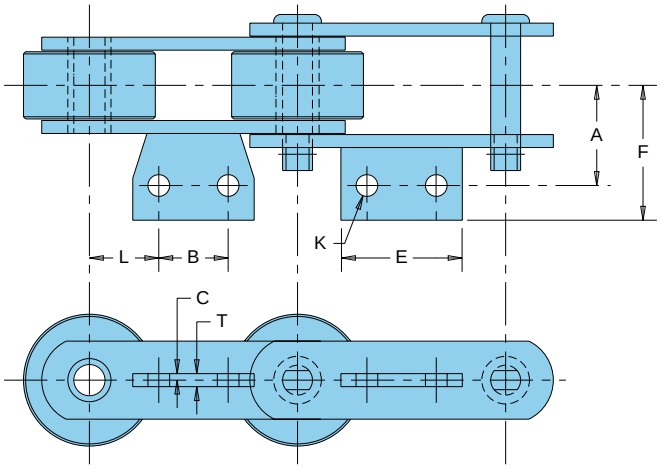
A-1 Attachment



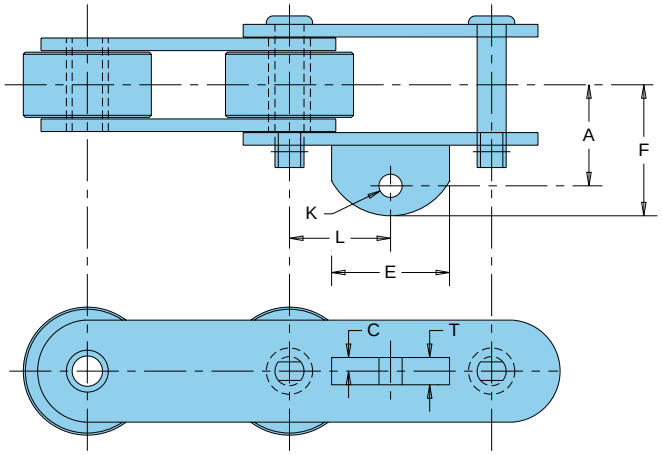
A-1/A-2 Attachment



A-11 and A-63 Attachment



A-22 and A-42 Attachment



Roller Conveyor Chain Attachment Specifications

All dimensions are in inches unless otherwise indicated.

Attachment Number	Chain Number	A	B	C	E	F	Bolt Diameter K_1	Bolt Diameter K_2	L	T	Approx. Weight (lbs./ft.)
A-1	53R	1.47		.81	2.00	2.16	.31		1.50	.19	4.4
	83R	2.00		1.00	2.00	2.84	.38		2.00	.25	8.1
	84R	2.66		1.25	2.00	3.66	.63		2.00	.38	18.0
	89R	2.00		1.25	2.00	3.17	.38		2.00	.38	11.0
	US-90R	2.00		1.13	3.13	2.63	.38		2.00	.19	6.3
	91R	1.81		1.06	2.88	2.47	.50		2.00	.31	7.9
	93R	1.88		1.00	1.63	2.69	.50		1.34	.25	5.5
	94R	1.38		.88	2.50	1.88	.38		2.00	.25	4.7
	95R	1.38		.81	2.63	2.16	.38		2.00	.19	3.9
	119R	2.09		1.06	2.88	2.80	.50		1.54	.31	7.9
	US-196R	2.00		1.25	3.50	2.63	.38		3.00	.25	6.6
	US-278R	1.91		.88	2.13	2.52	.38		1.30	.19	3.5
	378R	1.50		.88	.88	1.89	.31		.83	.19	4.4
	603R	2.00		1.13	3.50	2.70	.38		3.00	.25	8.8
	604R	2.00		1.13	3.50	2.72	.38		3.00	.25	6.3
	607R	2.00		1.13	3.50	2.70	.38		3.00	.25	7.4
	610R	2.56		1.50	4.00	3.33	.63		3.00	.38	15.4
	614R	2.13		1.63	2.50	3.08	.50		3.00	.38	13.0
	1188R	1.72		1.00	3.38	2.53	.38		2.00	.19	5.0
	50001	1.69		1.13	2.25	2.31	.50		2.50	.31	8.1
A-1/A-2	53R	1.47	1.06	.81	2.00	2.16	.31	.25	.97	.19	4.4
	US-90R	2.00	2.00	1.13	3.13	2.63	.38	.38	1.00	.19	6.3
	94R	1.38	1.50	.88	2.50	1.88	.38	.38	1.25	.25	4.7
	95R	1.38	1.19	.81	2.63	2.16	.31	.38	1.41	.19	3.9
A-11	53R	1.58	1.06	.09	2.00	1.94	.25		.97	.19	4.4
	94R	1.75	1.38	.13	2.50	2.50	.50		1.31	.25	5.2
	603R	2.56	2.25	.13	3.25	3.06	.25		1.88	.25	7.6
	604R	2.56	2.25	.13	3.25	3.06	.38		1.88	.25	7.6
	607R	2.56	2.25	.13	3.25	3.17	.38		1.88	.25	7.6
	614R	2.75	2.88	.19	4.50	3.56	.50		1.56	.38	12.5
	626R	2.19	2.25	.13	3.25	2.88	.38		1.88	.25	12.0
A-63	53R	1.63	.63	.09	1.50	2.09	.25		1.19	.19	4.4
A-22	94R	1.84		.19	1.25	2.44	.38		2.00	.38	4.5
	614R	2.25		.25	2.00	3.06	.50		3.00	.38	11.9
A-42	53R	1.56		.13	1.00	2.00	.38		1.50	.25	4.2
	86R	2.34		.19	2.00	3.16	.50		3.00	.38	6.4
	95R	1.63		.19	1.25	2.13	.38		2.00	.38	3.6
	119R	2.00		.25	1.38	2.69	.63		1.50	.50	7.5
	604R	2.34		.25	2.00	3.16	.63		3.00	.50	6.2
	614R	2.75		.25	2.00	3.75	.63		3.00	.50	12.3
	631R	2.75		.25	2.00	3.50	.63		3.00	.50	13.5
	1131R	2.84		.25	2.00	3.84	.63		3.00	.50	13.8
	1604R	2.31		.25	2.00	3.06	.63		3.00	.50	6.7
	2184RX	2.63		.25	2.00	3.63	.63		3.00	.50	13.6

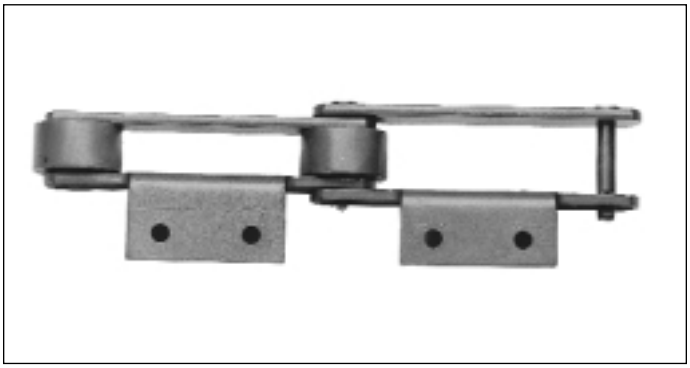
Note: Some A-1 attachments are supplied with three holes. Use the center hole.

Indicates this chain is normally stocked. All others are made-to-order.

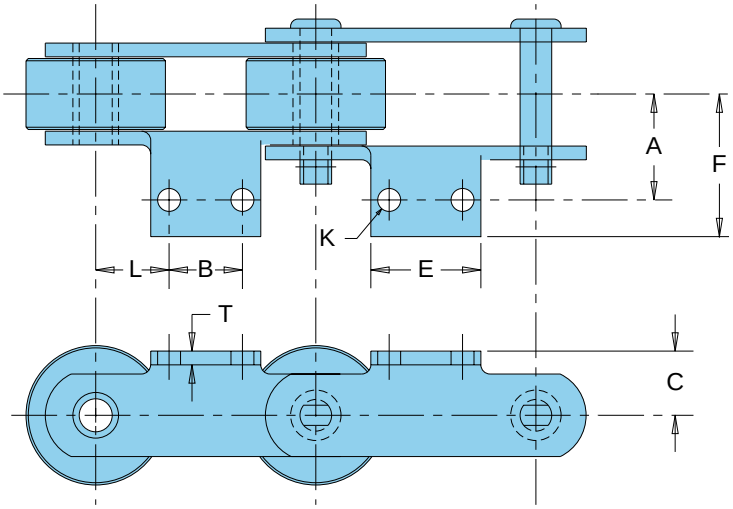
Style "A" attachments are furnished on the cottered side as standard. If requested, they can be furnished on the opposite side of the chain.

To locate compatible sprockets for your chain, refer to the Product Cross-Reference in Section D.

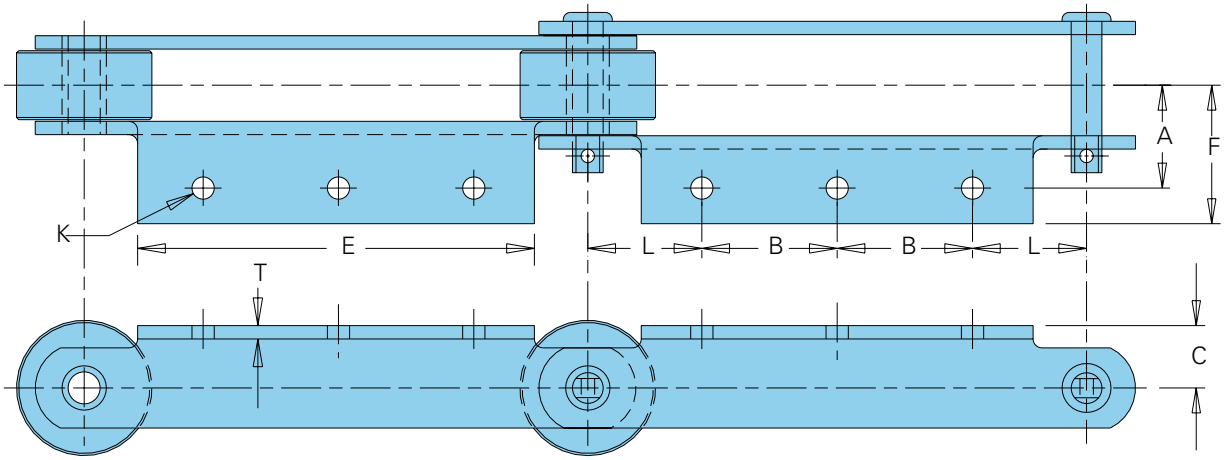
Note: Dimensions are subject to change. Contact Union Chain to obtain certified prints for design and construction.

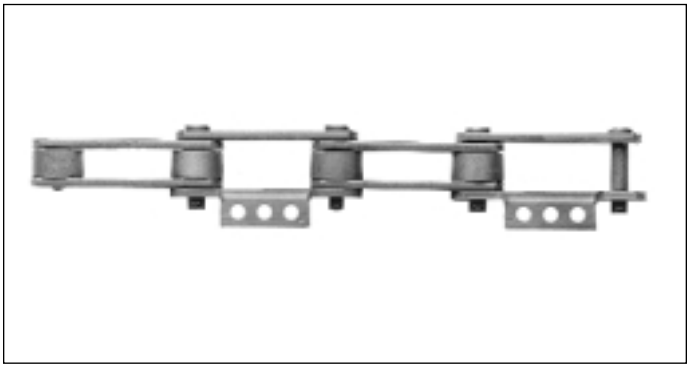


A-2 Attachment



A-3 Attachment





Roller Conveyor Chain Attachment Specifications (Continued)

All dimensions are in inches unless otherwise indicated.

Attachment Number	Chain Number						Bolt Diameter			Approx. Weight (lbs./ft.)
		A	B	C	E	F	K	L	T	
A-2	53R	1.47	1.06	.81	2.00	2.16	.25	.97	.19	4.4
	83R	2.00	1.75	1.00	2.88	2.84	.38	1.13	.25	8.1
	84R	2.66	1.75	1.25	2.88	3.41	.38	1.13	.38	18.0
	86R	2.00	2.00	1.13	3.50	2.72	.38	2.00	.25	6.2
	87R	2.13	1.25	.81	2.13	2.63	.31	.68	.25	4.8
	US-90R	2.00	2.00	1.13	3.13	2.63	.38	1.00	.19	6.3
	91R	1.81	1.75	1.06	2.88	2.47	.50	1.13	.31	7.9
	93R	1.88	1.25	1.00	2.00	2.69	.38	.88	.25	5.5
	94R	1.38	1.50	.88	2.50	1.88	.38	1.25	.25	4.7
	95R	1.38	1.19	.81	2.63	2.16	.31	1.41	.19	3.9
	96R	2.19	3.00	1.63	5.50	3.00	.50	1.50	.38	13.7
	119R	2.00	1.88	1.25	2.88	2.56	.31	.59	.31	7.9
	US-196R	2.00	2.00	1.25	3.50	2.63	.38	2.00	.25	6.6
	US-278R	2.09	1.25	.81	2.13	2.72	.31	.68	.19	3.9
	603R	2.00	2.00	1.13	3.50	2.72	.38	2.00	.25	8.9
	604R	2.00	2.00	1.13	3.50	2.72	.38	2.00	.25	6.0
	607R	2.00	2.00	1.13	3.50	2.72	.38	2.00	.25	6.9
	614R	2.13	2.63	1.63	5.50	2.92	.50	1.69	.38	13.0
	625R	2.19	2.00	1.63	4.63	2.91	.38	2.00	.25	12.5
	626R	2.19	2.00	1.63	3.50	3.05	.38	2.00	.38	12.7
	627R	2.00	2.00	1.13	3.50	2.80	.38	2.00	.31	8.5
	628R	2.36	2.00	1.63	3.50	3.25	.50	2.00	.38	10.2
	629R	2.00	2.50	2.00	3.50	2.86	.38	1.75	.31	11.7
	631R	2.13	2.63	1.63	5.50	2.92	.50	1.69	.38	14.2
	60001	2.08	2.13	1.25	3.25	2.69	.38	1.94	.31	8.4
	B-912R	2.56	3.50	1.75	5.50	3.91	.50	2.75	.25	11.1
	925R	2.50	3.50	1.75	5.50	3.38	.50	2.75	.25	10.7
	B-963R	2.88	3.50	2.50	5.50	4.28	.50	2.75	.25	14.6
	C-963R	2.88	3.50	2.50	5.50	4.28	.50	2.75	.25	15.0
	D-963R	2.88	3.50	2.50	5.50	4.28	.50	2.75	.25	13.9
	E-963R	2.88	3.50	2.50	5.50	4.28	.50	2.75	.25	13.9
	B-964R	3.00	3.50	2.88	5.50	4.41	.50	2.75	.31	19.4
	973R	3.75	3.50	3.63	5.50	4.88	.50	2.75	.38	26.0
	1113R	2.06	1.50	1.25	2.88	2.77	.38	1.27	.31	9.3
	1131R	3.00	2.63	1.63	5.50	3.75	.50	1.69	.38	15.5
	1188R	2.00	2.00	1.00	3.50	2.78	.38	1.00	.19	5.0
	B-1212R	2.56	6.00	1.75	8.00	3.56	.50	3.00	.25	9.5
	B-1263R	2.88	6.00	2.50	8.00	4.28	.50	3.00	.25	12.9
	D-1263R	2.88	6.00	2.50	8.00	4.28	.50	3.00	.25	13.1
	E-1263R	2.88	6.00	2.50	8.00	4.28	.50	3.00	.25	14.3
	B-1264R	3.00	6.00	2.88	8.00	4.41	.50	3.00	.31	17.1
	B-1266R	2.69	6.00	1.88	8.00	3.69	.50	3.00	.25	11.5
	1273R	3.75	6.00	3.63	8.00	5.34	.50	3.00	.38	25.8
	1276R	3.03	6.00	2.75	8.00	4.13	.50	3.00	.25	16.9
A-3	B-1863R	2.88	5.50	2.50	14.00	4.28	.50	3.50	.25	11.4
	D-1863R	2.88	5.50	2.50	14.00	4.28	.50	3.50	.25	11.9
	F-1863R	2.88	5.50	2.50	14.00	4.28	.50	3.50	.25	12.3
	B-1864R	3.00	11.00	2.88	14.00	4.00	.50	3.50	.31	15.1
	G-1864R	3.00	11.00	2.88	14.00	4.00	.50	3.50	.31	14.9
	1866R	4.00	11.00	4.13	13.50	5.17	.50	3.50	.38	32.0
	1867R	4.13	10.00	4.13	13.00	5.28	.50	4.00	.38	37.0
	1871R	3.75	11.00	3.63	14.00	4.91	.50	3.50	.38	26.3
	1873R	3.75	11.00	3.63	14.00	4.84	.50	3.50	.38	22.3

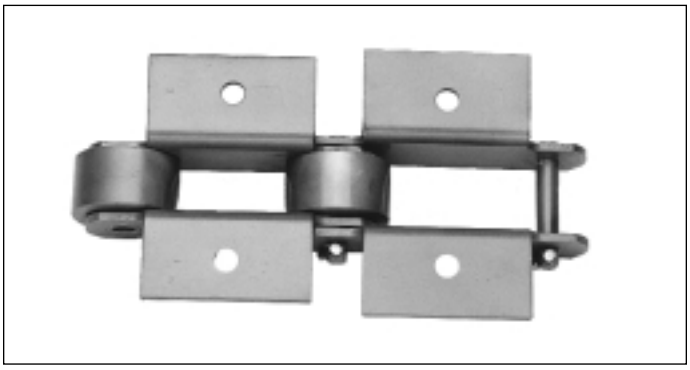
Note: Some A-2 attachments are supplied with three holes. Use the two outside holes.

Indicates this chain is normally stocked. All others are made-to-order.

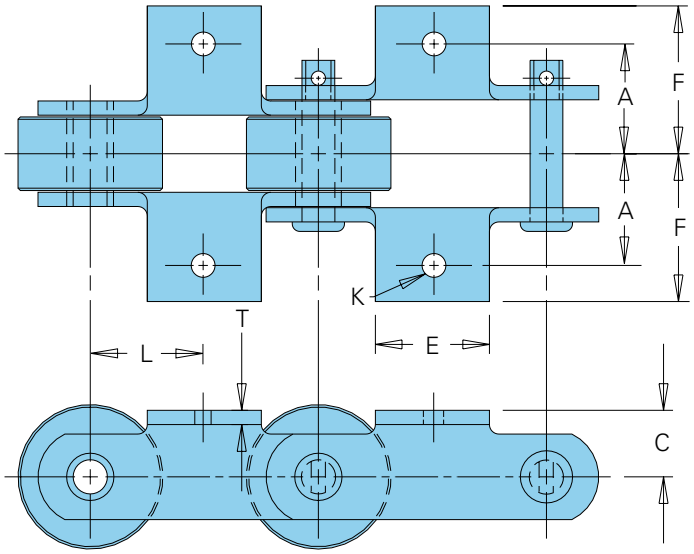
Style "A" attachments are furnished on the cottered side as standard. If requested, they can be furnished on the opposite side of the chain.

To locate compatible sprockets for your chain, refer to the Product Cross-Reference in Section D.

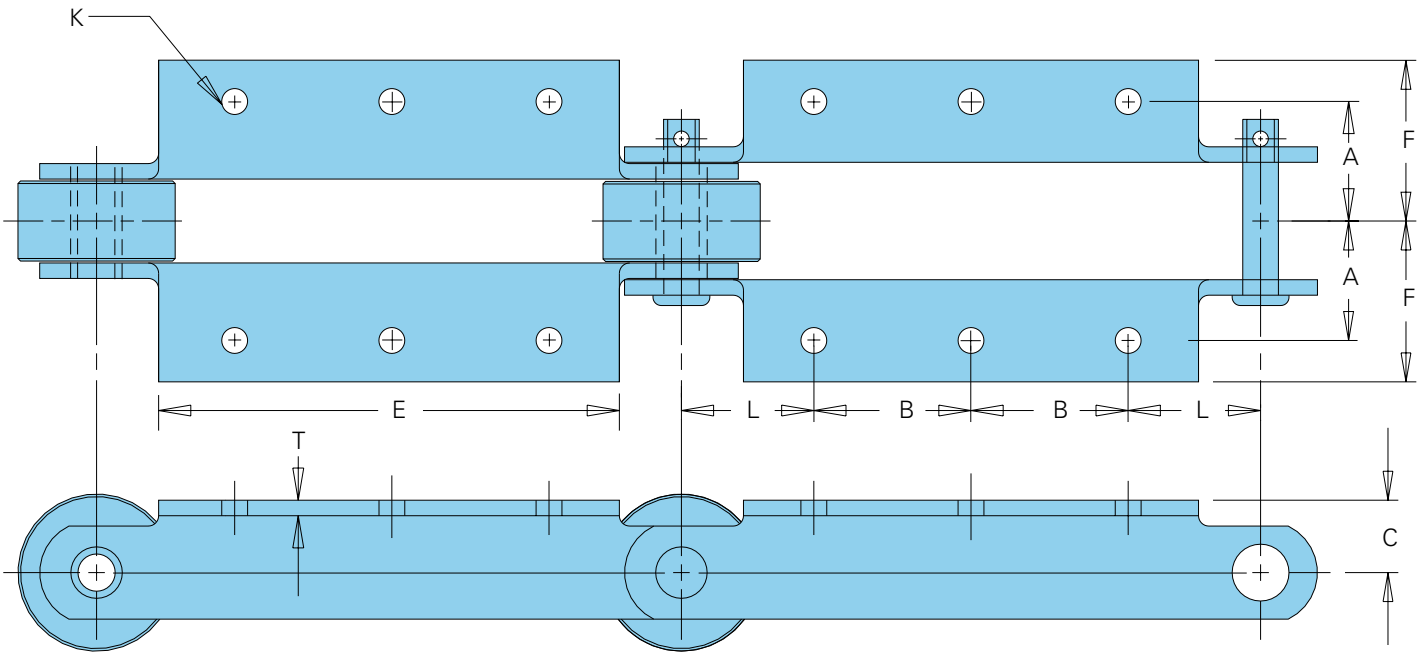
Note: Dimensions are subject to change. Contact Union Chain to obtain certified prints for design and construction.

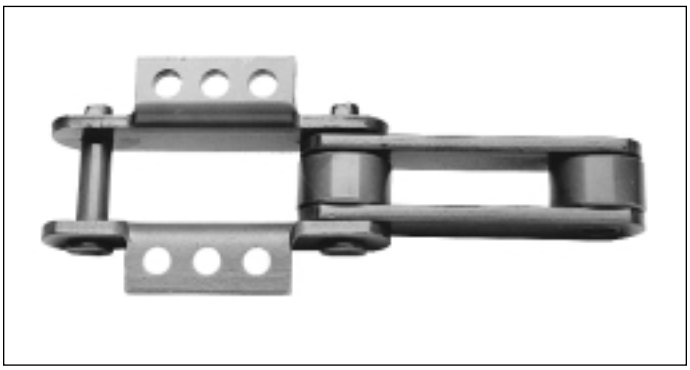


K-1 Attachment



K-3 Attachment





Roller Conveyor Chain Attachment Specifications (Continued)

All dimensions are in inches unless otherwise indicated.

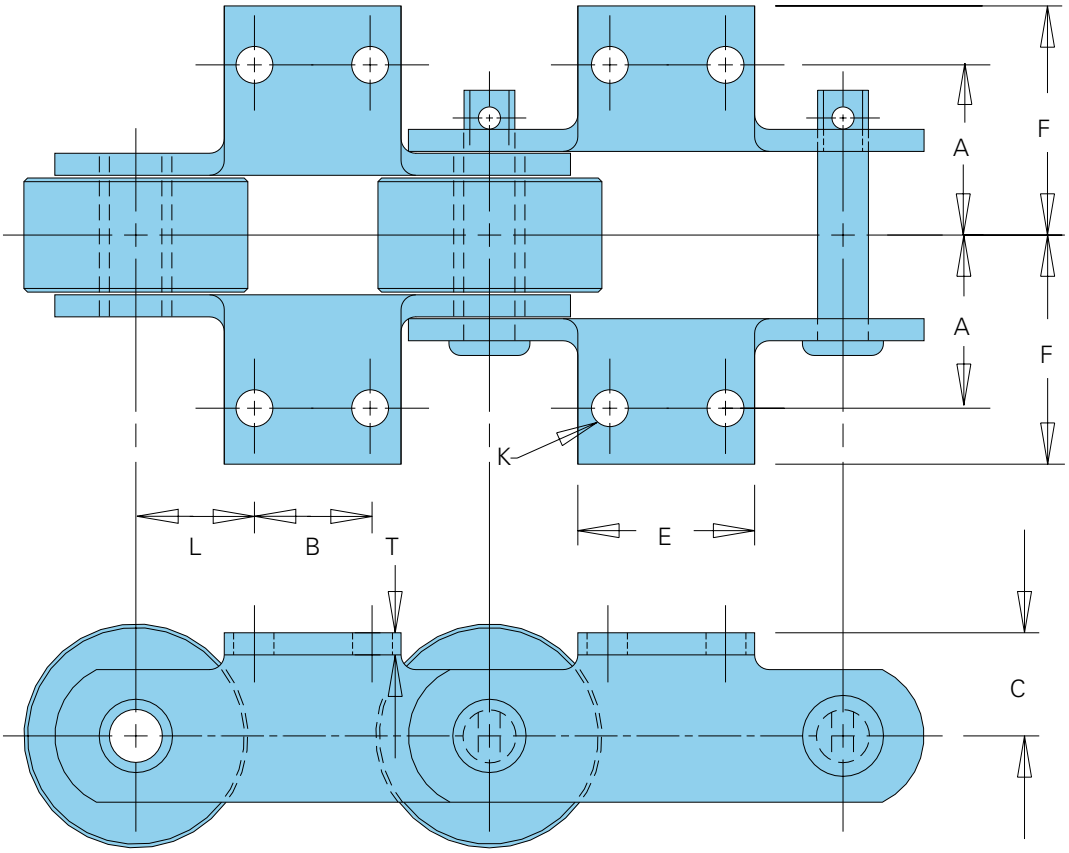
Attachment Number	Chain Number						Bolt Diameter			Approx. Weight (lbs./ft.)
		A	B	C	E	F	K	L	T	
K-1	53R	1.47		.81	2.00	2.16	.31	1.50	.19	4.9
	83R	2.00		1.00	2.00	2.84	.38	2.00	.25	9.4
	84R	2.66		1.25	2.00	3.66	.63	2.00	.38	20.7
	89R	2.00		1.25	2.00	3.17	.38	2.00	.38	13.0
	US-90R	2.00		1.13	3.13	2.63	.38	2.00	.19	7.3
	91R	1.81		1.06	2.88	2.47	.50	2.00	.31	8.8
	93R	1.88		1.00	1.63	2.69	.50	1.34	.25	6.0
	94R	1.38		.88	2.50	1.88	.38	2.00	.25	5.3
	95R	1.38		.81	2.63	2.16	.38	2.00	.19	4.4
	96R	2.19		1.63	5.50	2.89	.63	3.00	.38	15.8
	119R	2.09		1.06	2.88	2.80	.50	1.54	.31	9.0
	US-196R	2.00		1.25	3.50	2.63	.38	3.00	.25	7.5
	US-278R	1.91		.81	2.13	2.47	.38	1.30	.19	4.1
	378R	1.50		.88	.88	1.89	.31	.83	.19	5.1
	603R	2.00		1.13	3.50	2.72	.38	3.00	.25	9.7
	604R	2.00		1.13	3.50	2.72	.38	3.00	.25	7.2
	607R	2.00		1.13	3.50	2.78	.38	3.00	.25	8.3
	610R	2.56		1.50	4.00	3.32	.63	3.00	.38	17.3
	614R	2.13		1.63	2.50	3.08	.50	3.00	.38	15.0
	1188R	1.72		1.00	3.38	2.58	.38	2.00	.19	5.9
K-3	B-1863R	2.88	5.50	2.50	14.00	4.28	.50	3.50	.25	14.1
	D-1863R	2.88	5.50	2.50	14.00	4.28	.50	3.50	.25	14.6
	F-1863R	2.88	5.50	2.50	14.00	4.28	.50	3.50	.25	15.0
	B-1864R	3.00	5.50	2.88	14.00	4.00	.50	3.50	.31	17.3
	G-1864R	3.00	5.50	2.25	14.00	4.00	.50	3.50	.31	18.6
	1866R	4.00	5.50	4.13	13.50	5.16	.50	3.50	.38	37.7
	1867R	4.13	5.00	4.13	13.00	5.28	.50	4.00	.38	42.5
	1871R	3.75	5.50	3.63	14.00	4.91	.50	3.50	.38	31.7
	1873R	3.75	5.50	3.63	14.00	4.84	.50	3.50	.38	27.7

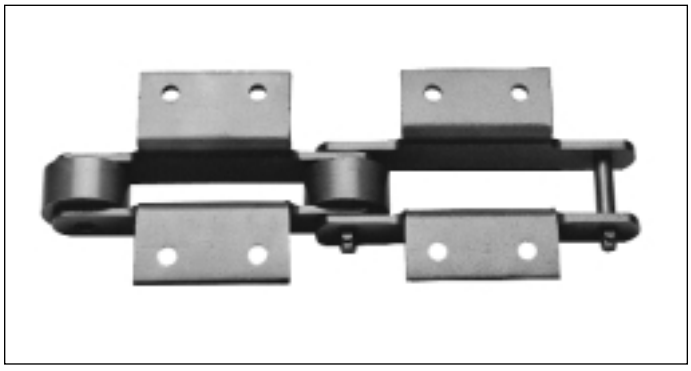
Note: Some K-1 attachments are supplied with three holes. Use the center hole.

To locate compatible sprockets for your chain, refer to the Product Cross-Reference in Section D.

Note: Dimensions are subject to change. Contact Union Chain to obtain certified prints for design and construction.

K-2 Attachment





Roller Conveyor Chain Attachment Specifications (Continued)

All dimensions are in inches unless otherwise indicated.

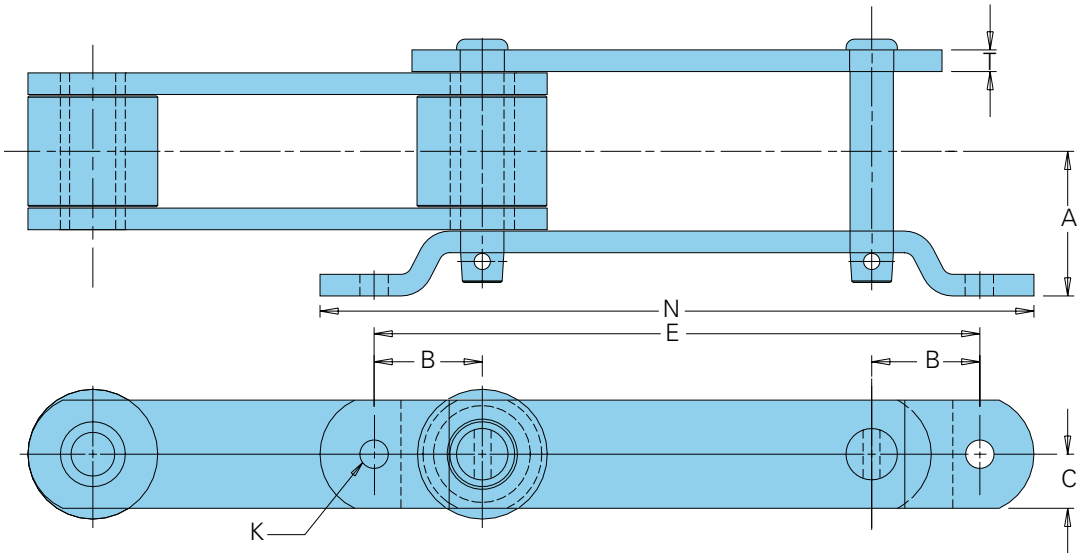
Attachment Number	Chain Number						Bolt Diameter			Approx. Weight (lbs./ft.)
		A	B	C	E	F	K	L	T	
K-2	53R	1.47	1.06	.81	2.00	2.16	.25	.97	.19	4.9
	83R	2.00	1.75	1.00	2.88	2.84	.38	1.13	.25	9.4
	84R	2.66	1.75	1.25	2.88	3.41	.38	1.13	.38	20.7
	87R	2.13	1.25	.81	2.13	2.63	.31	.68	.25	5.8
	US-90R	2.00	2.00	1.13	3.25	2.63	.38	1.00	.19	7.3
	91R	1.81	1.75	1.06	2.88	2.47	.50	1.13	.31	8.8
	93R	1.88	1.25	1.00	2.00	2.69	.38	.88	.25	6.0
	94R	1.38	1.50	.88	2.50	1.88	.38	1.25	.25	5.3
	95R	1.38	1.19	.81	2.63	2.16	.31	1.41	.19	4.4
	96R	2.19	3.00	1.63	5.50	3.00	.50	1.50	.38	15.8
	96RX	2.19	3.00	1.63	5.50	2.93	.50	1.50	.38	15.8
	119R	2.00	1.88	1.25	2.88	2.56	.31	.59	.31	9.0
	US-196R	2.00	2.00	1.25	3.50	2.63	.38	2.00	.25	7.5
	US-278R	2.09	1.25	.81	2.13	2.72	.31	.68	.19	4.1
	603R	2.00	2.00	1.13	3.50	2.72	.38	2.00	.25	9.1
	604R	2.00	2.00	1.13	3.50	2.72	.38	2.00	.25	7.0
	607R	2.00	2.00	1.13	3.50	2.72	.38	2.00	.25	7.4
	614R	2.13	2.63	1.63	5.50	2.92	.50	1.69	.38	15.0
	625R	2.19	2.00	1.63	4.63	2.91	.38	2.00	.25	13.9
	626R	2.19	2.00	1.63	3.50	3.05	.38	2.00	.38	14.7
	627R	2.00	2.00	1.13	3.50	2.80	.38	2.00	.31	10.7
	628R	2.38	2.00	1.63	3.50	3.25	.50	2.00	.38	11.7
	629R	2.00	2.50	2.00	3.50	2.86	.38	1.75	.31	13.7
	631R	2.13	2.63	1.63	5.50	2.92	.50	1.69	.38	16.4
	800RX	2.59	4.50	2.19	7.00	3.55	.63	1.75	.50	26.1
	806R	2.59	3.50	2.19	6.88	3.80	.63	2.25	.50	22.5
	B-912R	2.56	3.50	1.75	5.50	3.91	.50	2.75	.25	13.1
	925R	2.50	3.50	1.75	5.50	3.38	.50	2.75	.25	13.2
	B-963R	2.88	3.50	2.50	5.50	4.28	.50	2.75	.25	16.6
	D-963R	2.88	3.50	2.50	5.50	4.28	.50	2.75	.25	16.0
	E-963R	2.88	3.50	2.50	5.50	4.28	.50	2.75	.25	18.5
	B-964R	3.00	3.50	2.88	5.50	4.41	.50	2.75	.31	22.3
	973R	3.00	3.00	3.00	5.00	4.00	.50	2.00	.38	30.0
	1113R	2.06	1.50	1.25	2.88	2.77	.38	1.27	.31	11.0
	1131R	3.00	2.63	1.63	5.50	3.75	.50	1.69	.38	18.4
	1188R	2.00	2.00	1.00	3.50	2.78	.38	1.00	.19	5.9
	B-1212R	2.56	6.00	1.75	8.00	3.56	.50	3.00	.25	11.7
	B-1263R	2.88	6.00	2.50	8.00	4.28	.50	3.00	.25	15.2
	D-1263R	2.88	6.00	2.50	8.00	4.28	.50	3.00	.25	15.4
	E-1263R	2.88	6.00	2.50	8.00	4.28	.50	3.00	.25	16.6
	B-1264R	3.00	6.00	2.88	8.00	4.41	.50	3.00	.31	20.3
	B-1266R	2.69	6.00	1.88	8.00	3.69	.50	3.00	.25	14.0
	1273R	3.75	6.00	3.63	8.00	5.34	.50	3.00	.38	30.4
	1276R	3.03	6.00	2.75	8.00	4.13	.50	3.00	.25	19.2
	2178RX	2.19	3.00	1.63	4.50	3.02	.50	1.50	.38	15.3
	2198R	2.19	3.00	1.63	4.50	3.31	.50	1.50	.50	18.2
	2198RX	2.19	3.00	1.63	4.50	3.31	.50	1.50	.50	18.2

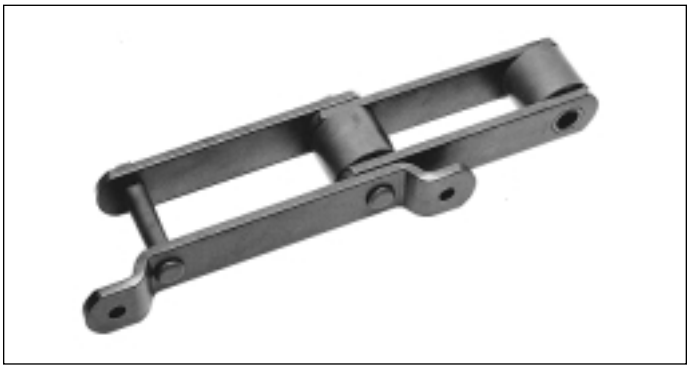
Note: Some K-2 attachments are supplied with three holes. Use the two outside holes.

To locate compatible sprockets for your chain, refer to the Product Cross-Reference in Section D.

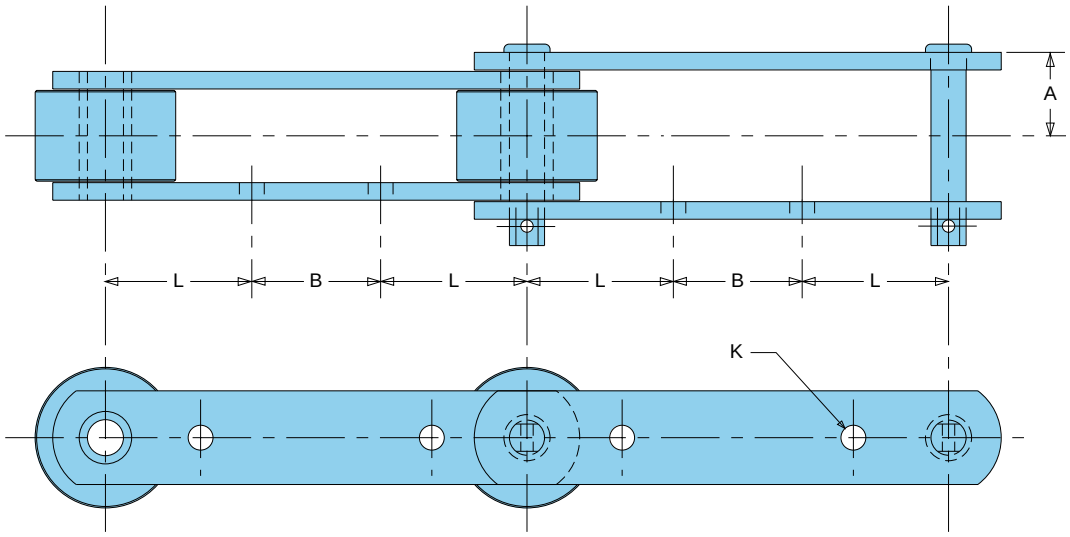
Note: Dimensions are subject to change. Contact Union Chain to obtain certified prints for design and construction.

G-5 Attachment





G-6 Attachment



Roller Conveyor Chain Attachment Specifications (Continued)

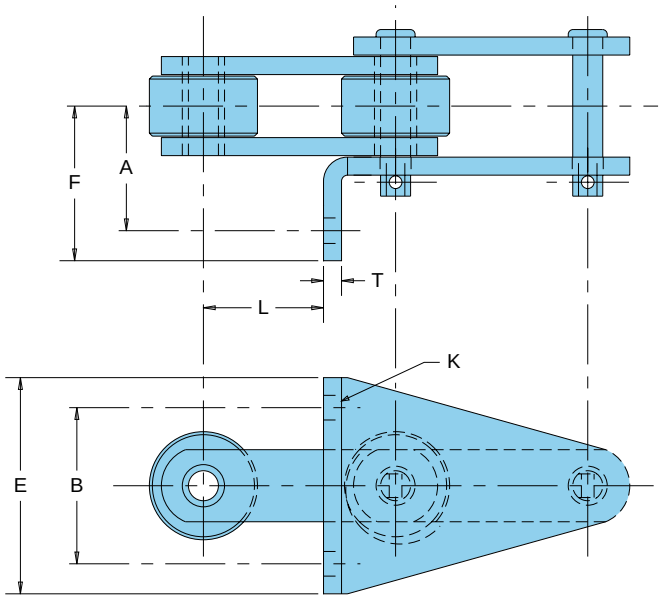
All dimensions are in inches unless otherwise indicated.

Attachment Number	Chain Number					Bolt Diameter				Approx. Weight (lbs./ft.)
		A	B	C	E	K	L	N	T	
G-5	4004	3.34	2.50	1.25	14.00	.63	—	16.50	.50	18.5
	4009	3.03	2.50	1.25	14.00	.63	—	16.50	.38	14.7
	4065	3.94	2.50	1.75	14.00	.63	—	16.50	.63	38.6
G-6	809R	1.53	2.75			.50	3.13			14.2
	B-912R	1.41	2.75			.50	3.13			10.0
	925R	1.38	2.75			.50	3.13			8.5
	B-963R	1.78	3.00			.50	3.00			13.9
	D-963R	1.78	3.00			.50	3.00			13.2
	E-963R	1.78	3.00			.50	3.00			15.8
	B-964R	1.91	2.50			.50	3.25			18.1
	973R	2.34	3.50			.63	2.75			25.5
	B-1212R	1.41	3.75			.50	4.13			8.2
	B-1263R	1.78	3.75			.50	4.13			11.6
	C-1263R	1.78	3.75			.50	4.13			11.9
	D-1263R	1.78	3.75			.50	4.13			11.8
	E-1263R	1.78	3.75			.50	4.13			13.0
	B-1264R	1.91	3.75			.50	4.13			15.4
	B-1266R	1.59	3.75			.50	4.13			10.1
	1273R	2.34	3.75			.63	4.13			23.2
	1276R	1.66	5.50			.50	3.25			20.6
	B-1863R	1.78	6.00			.50	6.00			9.9
	D-1863R	1.78	6.00			.50	6.00			10.4
	F-1863R	1.78	6.00			.50	6.00			10.8
	B-1864R	1.91	6.00			.63	6.00			12.8
	G-1864R	1.91	6.00			.63	6.00			12.6
	1867R	2.78	6.00			.63	6.00			34.9
	1871R	2.41	6.00			.63	6.00			23.3
	1873R	2.34	6.00			.63	6.00			18.8

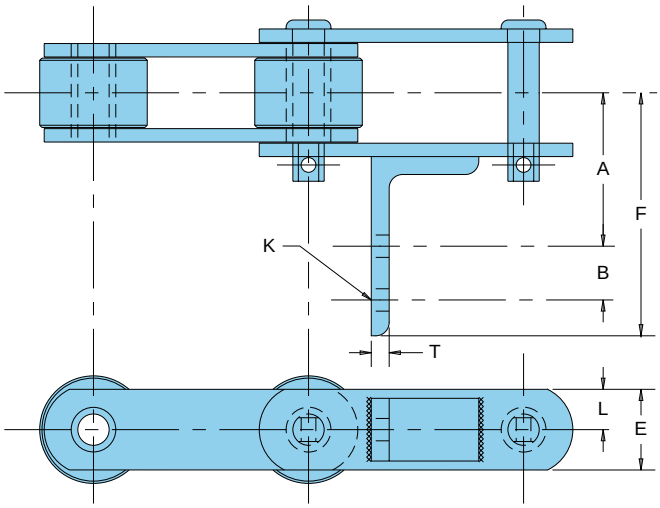
To locate compatible sprockets for your chain, refer to the Product Cross-Reference in Section D.

Note: Dimensions are subject to change. Contact Union Chain to obtain certified prints for design and construction.

G-19 Attachment



G-29 Attachment



Roller Conveyor Chain Attachment Specifications (Continued)

All dimensions are in inches unless otherwise indicated.

Attachment Number	Chain Number					Bolt Diameter			Approx. Weight (lbs./ft.)
		A	B	E	F	K	L	T	
G-19	89R	2.63	3.25	4.50	3.44	.50	2.50	.38	11.7
	89RX	2.63	3.25	4.50	3.24	.50	2.50	.38	11.7
	925R	2.56	3.50	5.50	3.38	.50	2.63	.25	9.8
	B-1263R	2.78	3.50	5.50	3.78	.50	2.63	.25	13.9
	C-1263R	2.78	3.50	5.50	3.78	.50	2.63	.25	14.2
	D-1263R	2.78	3.50	5.50	3.78	.50	2.63	.25	13.4
	E-1263R	2.78	3.50	5.50	3.78	.50	2.63	.25	15.3
	B-1264R	2.91	3.50	5.50	3.91	.50	2.63	.31	18.2
	B-1266R	2.59	3.50	5.50	3.59	.50	2.63	.25	12.0
	1273R	3.34	5.00	7.50	4.34	.50	2.63	.38	27.6
	B-1863R	2.78	3.50	5.50	3.78	.50	5.63	.25	11.0
	D-1863R	2.78	3.50	5.50	3.78	.50	5.63	.25	11.5
	F-1863R	2.78	3.50	5.50	3.78	.50	5.63	.25	11.9
	B-1864R	2.91	3.50	5.50	3.91	.50	5.63	.31	14.2
	G-1864R	2.91	3.50	5.50	3.91	.50	5.63	.31	14.0
	1867R	3.78	3.50	5.50	4.78	.50	5.63	.38	35.9
	1871R	3.41	3.50	5.50	4.41	.50	5.63	.38	24.7
	1873R	3.34	5.00	7.50	4.34	.50	5.63	.38	21.2
G-29	94R	1.84	1.13	1.25	3.69	.38	.63	.25	5.3
	1131R	2.78	1.50	2.00	5.03	.44	1.00	.38	15.2

To locate compatible sprockets for your chain, refer to the Product Cross-Reference in Section D.

Note: Dimensions are subject to change. Contact Union Chain to obtain certified prints for design and construction.

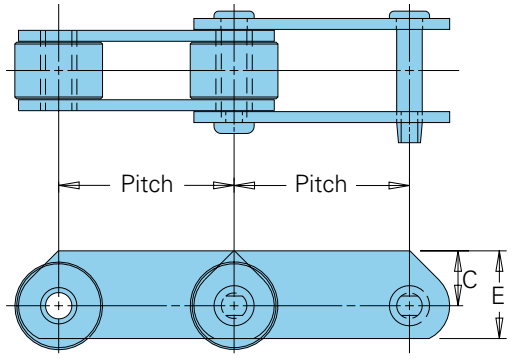
Roller Conveyor Chain Attachment Specifications (Continued)

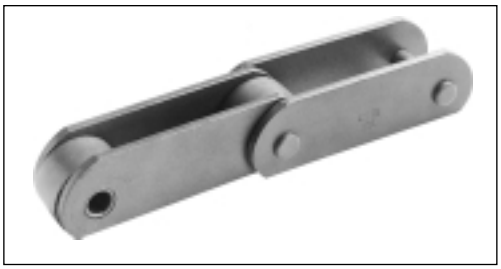
All dimensions are in inches unless otherwise indicated.

Attach. Number	Chain Number	Pitch	C	E	Approx. Weight (lbs./ft.)
High Side Bar Chains	53R	3.000	.94	1.50	5.0
	94R	4.000	.88	1.50	4.8
	95R	4.000	.94	1.50	4.1
	US-90R	4.000	1.25	2.00	7.0
	89R	4.000	1.25	2.00	11.9
	84R	4.000	1.50	2.25	16.4
	6053R	6.000	1.38	2.00	5.1
	627R	6.000	1.25	2.00	6.6
	CC5	6.000	1.50	2.50	11.0
	614R	6.000	2.00	3.00	14.7

Indicates this chain is normally stocked. All others are made-to-order.

High Sidebar Chains

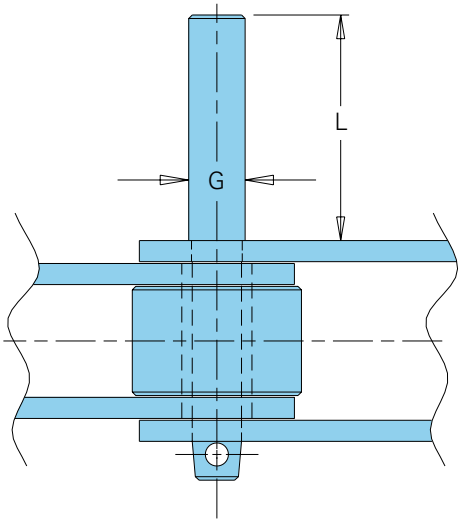




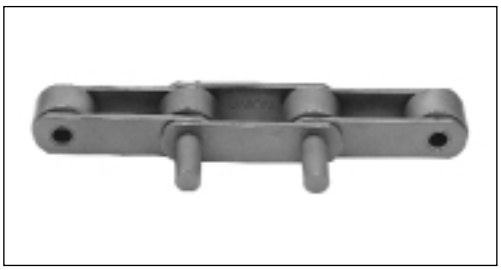
D-1, D-5 Attachments

Chain Number	Diameter	L	Approx. Weight (lbs./ft.)
	G		
53R	.75	2.00	4.9
94R	.75	2.00	4.8
US-196R	.75	3.00	5.8

D-1 and D-5



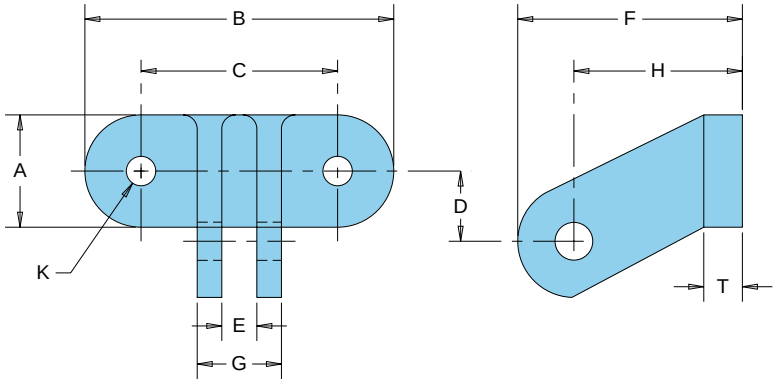
Extended pin attachments of any length can be furnished on all chains listed provided "G" dimension is the same as or exceeds the chain pin diameter.



To locate compatible sprockets for your chain, refer to the Product Cross-Reference in Section D.

Note: Dimensions are subject to change. Contact Union Chain to obtain certified prints for design and construction.

Style C Attachment

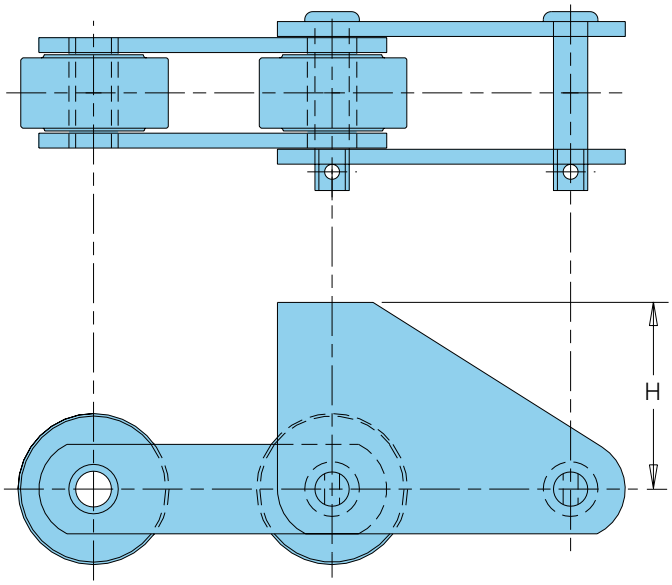


Hinged Bucket and Scraper Flight Wing Attachment Specifications

All dimensions are in inches unless otherwise indicated.

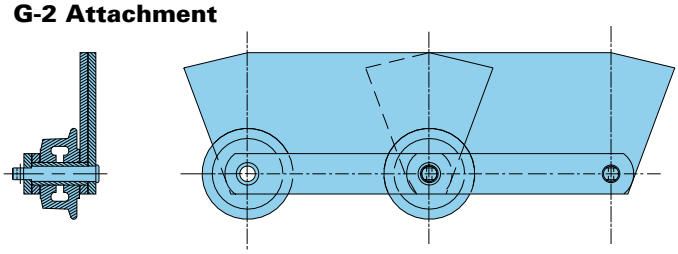
Bucket Wing Style	Attach. No.	Standard									Bolt Dia.	Rivet Dia.		Approx. Weight (lbs./ft.)
			A	B	C	D	E	F	G	H	K	L	T	
Style C	2C 15C	X	2.00 1.75	5.13 3.50	3.50 2.50	1.00 .81	.63 .44	4.00 1.81	1.50 1.00	3.08 1.13	.50 .31	.63 .38	.69 .28	2.8 .7

L-2 and S-1 Attachments



Attachments L-2 and S-1 can be furnished with any chain to suit special requirements provided height of dimension "H" does not exceed five inches from center line of chain.

G-2 Attachment



Attachment G-2 is simply an extra height chain sidebar with attachment angle usually used as pan ends on style B and D apron conveyors as shown on page A-40. It can be furnished with any chain in any reasonable height to suit requirements. The attachment is designated by G-2 followed by a hyphen and number giving overall height in inches. For example, G-2-5 is a sidebar with overall height of 5". G-2-6 1/2 is a sidebar with overall height of 6 1/2".

To locate compatible sprockets for your chain, refer to the Product Cross-Reference in Section D.

Note: Dimensions are subject to change. Contact Union Chain to obtain certified prints for design and construction.

APRON CONVEYORS

Move loose bulk materials like coal, lime, sand, stone, and sugar cane along horizontal or inclined conveyors. Apron Conveyors are especially useful as feeders to elevating systems, for picking tables and loading booms, and for long horizontal or inclined conveyors.

Create Custom Solutions

Union engineers will help you create a complete apron conveyor system for your application, including the right attachments, rollers, and lubrication packages to meet your specific requirements.

Apron Conveyors from Union

- Wide selection and styles.
- Customized for your application.
- Reliable, hassle-free operation.
- Cost-efficient value for your investment.

Choosing Metal Thickness

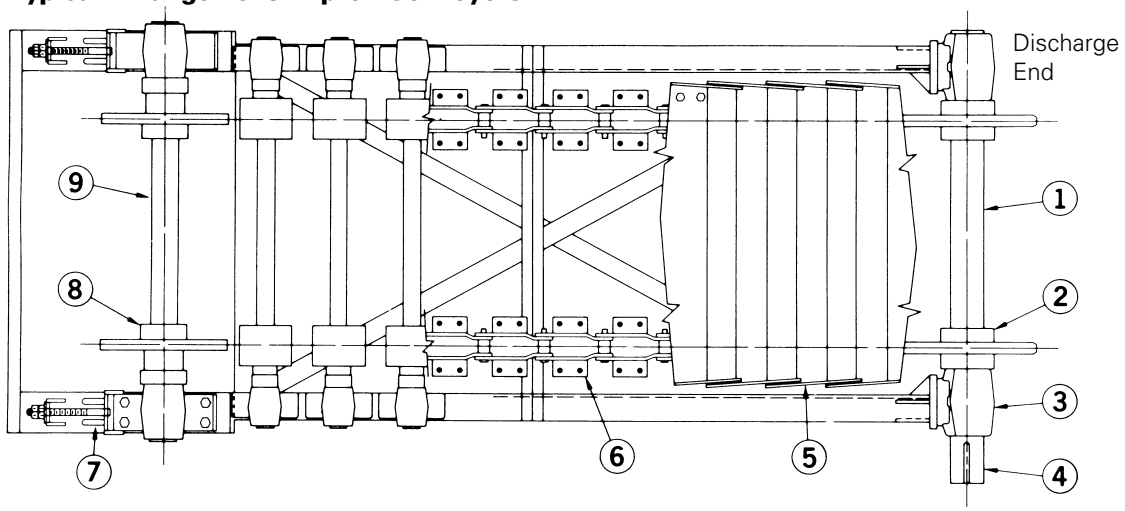
Experience is usually the best guideline for specifying the metal thickness for pans and aprons. Make sure you consider the following points.

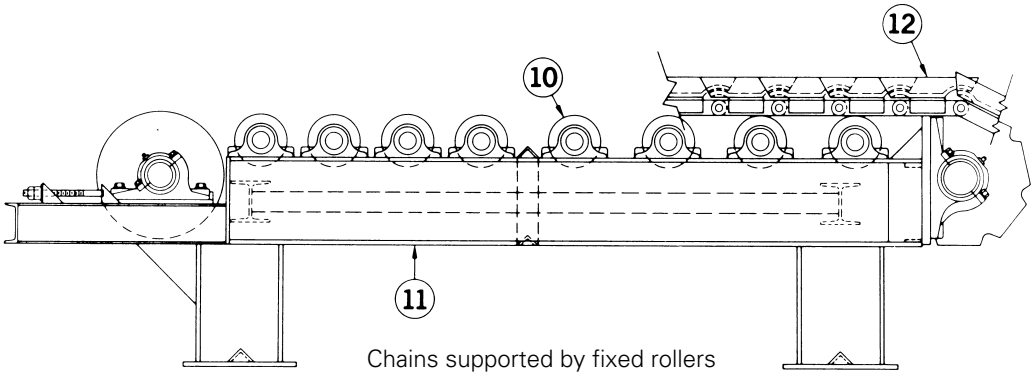
1. Number of chain strands to be used.
2. Required service life.
3. Manufacturing restrictions.
4. Weight of each apron support. Deflection must be limited to prevent binding between overlapping pans.
5. Corrosive and abrasive properties of conveyed materials.

Applications Chart

Pan/Apron Suggested Thickness (inches)	Service Conditions	Material Handled
3/8	Heavy	Highly abrasive, corrosive or large impact loads
1/4 - 5/16	Medium	Moderately corrosive, abrasive or impact loads
3/16	Light	Mildly abrasive, corrosive or impact loads

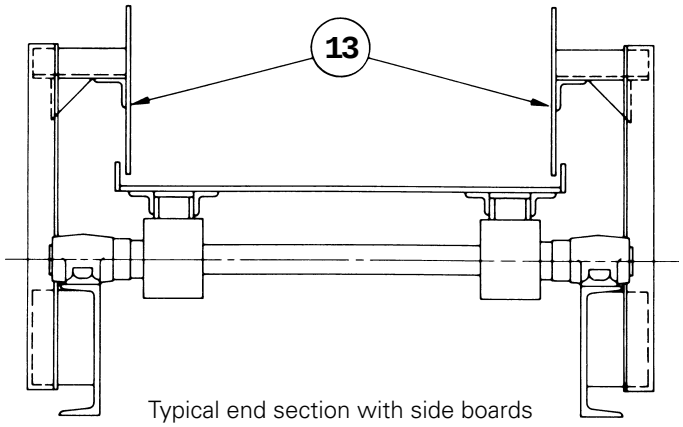
Typical Arrangement—Apron Conveyors





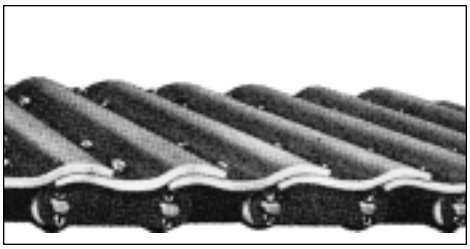
Chains supported by fixed rollers

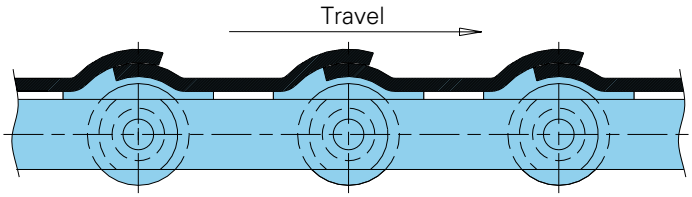
1. Head shaft — Discharge end.
2. Head shaft sprockets — Keyed to shaft.
3. Pillow blocks.
4. Drive end — Chain drive.
5. Apron assembly — Bolted to chain attachments.
6. Conveyor chain — Offset sidebar or straight sidebar (two or three strands normally used).
7. Take up — Normally located on tail shaft end.
8. Tail shaft sprockets — Only one keyed to shaft (other sprockets locked in place with collars).
9. Tail shaft.
10. Intermediate rollers — Supports chain sections when conveyor is heavily loaded.
11. Conveyor structure.
12. Pan ends — Welded to aprons.
13. Stationary sideboards — Offer additional capacity.



Typical end section with side boards

Style A



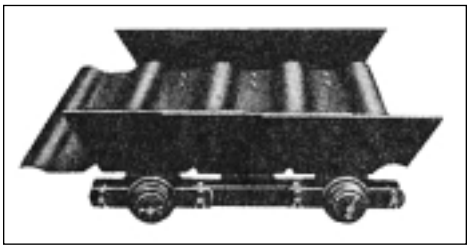


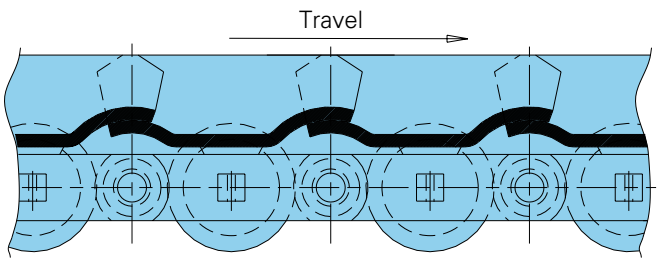
Uses
- Adaptable for any pitch conveyor.
- Most widely used style for horizontal or incline applications up to 35 degrees.

Advantages
- More leakproof than other styles of apron conveyor.
- With K attachments, the load is distributed evenly on both chains.
- Pan ends, when needed, fasten directly to apron and not to chain.

Attachments
- A attachments (one side of chain only) for long center distances.
- K attachments (both sides of chain) for short center distances.

Style A — Outboard Roller Support (OBR)



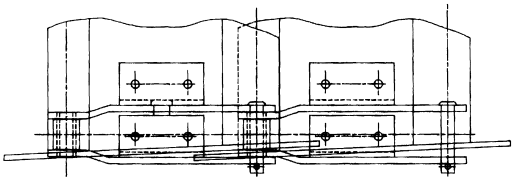


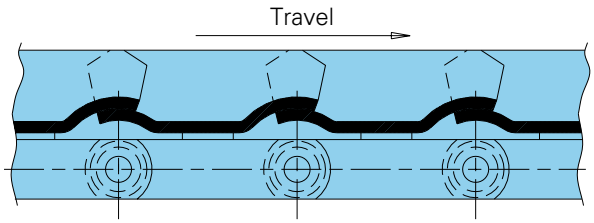
Uses
- Handles fine abrasive materials on incline applications up to 35 degrees.
- Longer pitch conveyors with two strands of chain mounted below and close to the ends of the pans.

Advantages
- Close-fitting members hold leakage to a minimum, protecting the conveyor and avoiding damage when handling abrasives.
- Reduced maintenance costs because outboard rollers may be removed for inspection or renewal without dismantling chains or pans.
- Conveyed load is carried on outboard rollers.
- Head shaft terminal load is carried on chain rollers.

Attachments
- A-2, E-2, M-1 attachments are commonly used.

Style A — Fixed Roller Support



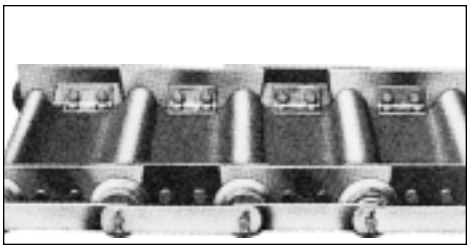


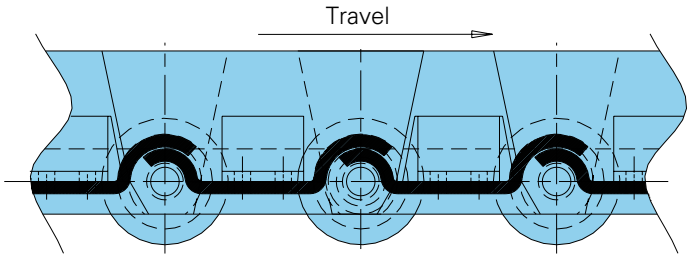
Uses
- Handles heavy conveyed materials.
- Withstands high-impact loads.

Advantages
- Chain is supported under sidebars by fixed frame rolls that transfer load instead of chain joint rollers.
- The close-fitting members keep leakage to a minimum, protecting your equipment from abrasives.

Attachments
- K attachments usually improve load distribution.
- K-1, K-2, A-1, A-2, E-2 attachments are commonly used.

Style B





Uses

- Suitable for heaviest duty conditions; generally used in longer pitch conveyors.
- Adaptable to various service and operational conditions for horizontal or incline applications as much as 35 degrees.

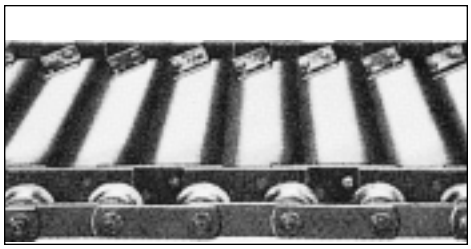
Advantages

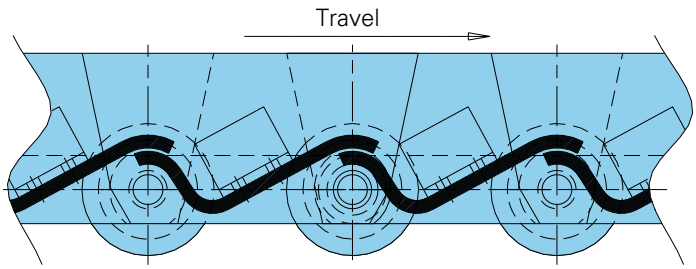
- Deep beads form a rigid pan for heavy loads on wide conveyors.
- Chain rollers permit return strand to roll on a track.
- Through-rods and load deflection rail supports may be used to prevent excessive chain loading under heavy impact conditions.

Attachments

- G-2 attachments (high sidebars with angles) contain material, add strength, and function as moving pan ends.

Style D





Uses

- Positive discharge aprons.
- Adaptable to various service and operating conditions for horizontal or incline applications as much as 35 degrees.

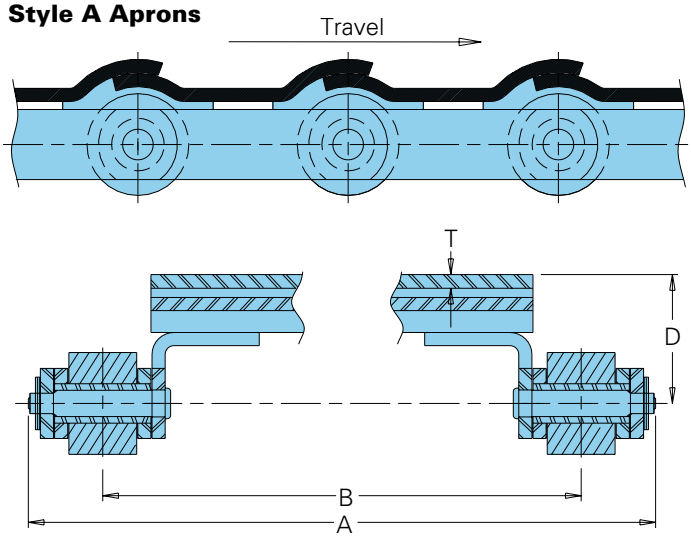
Advantages

- Higher angle of discharge reduces height of fall when unloading, reducing lump breakage.
- Angular mounting of apron on chain helps resist rollback motion of material on inclined conveyors.

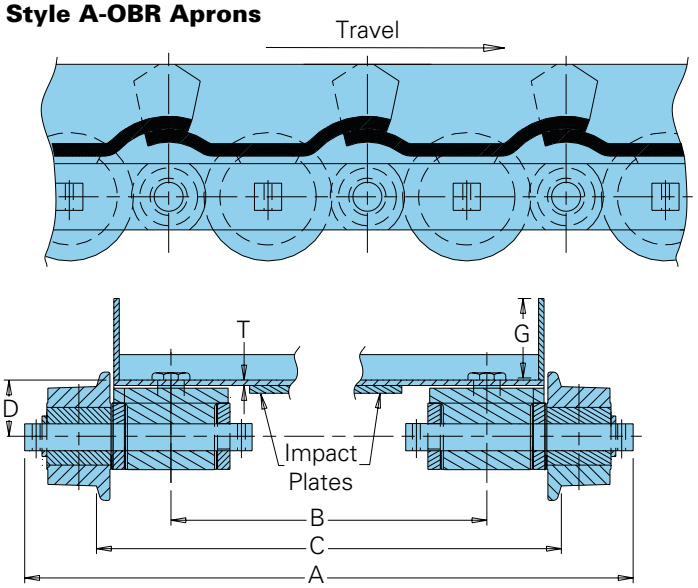
Attachments

- G-2 attachments (high sidebars with angles) contain material, add strength, and function as moving pan ends.

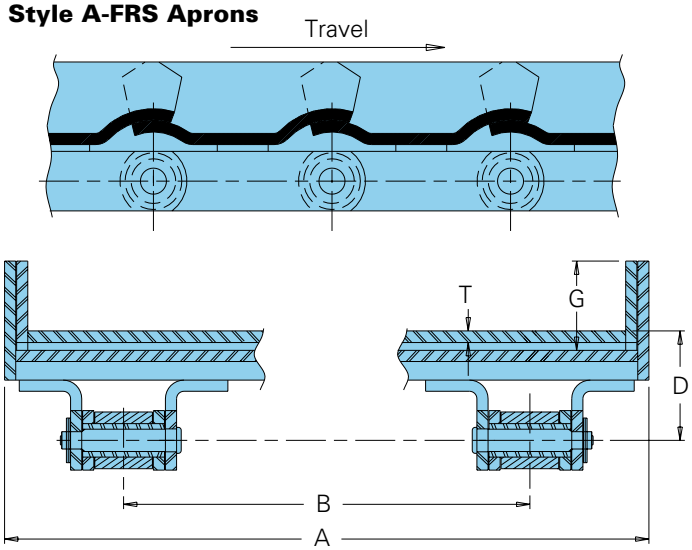
Style A Aprons



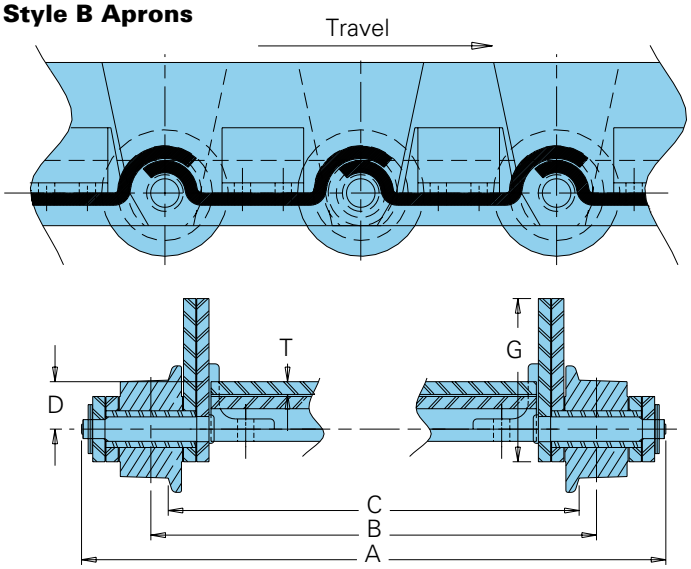
Style A-OBR Aprons



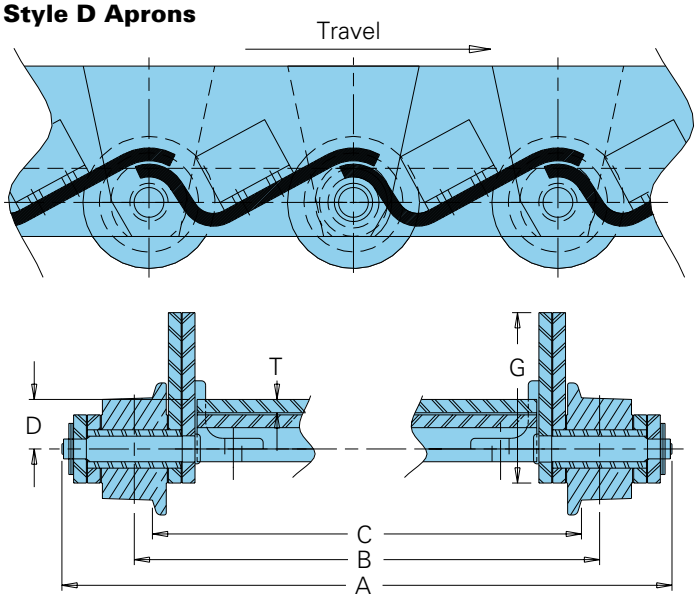
Style A-FRS Aprons



Style B Aprons



Style D Aprons



Apron Conveyors

All dimensions are in inches unless otherwise indicated.

Style	Chain Number	Pitch	Width[1]			Centerline Chain to Top of Pan Bead	Pan End Height	Pan Th.	Work Load (lbs.)[2]	Approximate Weight (lbs.)		
			Overall	Center to Center Sprocket	Track Gauge					Conveyor Weight (ft.) 18" Pan[3]	Approx. Wgt. Each 1" Added to Height	Weight Added Each 6" of Width
			A	B	C	D	G	T				
Style A Aprons	95R	4.000	21.88	19.38		2.00		.19	4,200	24.2		3.8
	US-90R	4.000	21.44	19.56		2.00		.19	4,800	28.0		3.8
	US-90R	4.000	21.44	19.56		2.06		.25	4,800	33.7		5.1
	89R	4.000	23.94	20.06		2.06		.25	9,000	44.3		5.1
	89R	4.000	23.94	20.06		2.31		.31	9,000	50.0		6.4
	89R	4.000	23.94	20.06		2.38		.38	9,000	55.7		7.7
	604R	6.000	23.00	19.81		2.19		.19	7,000	27.0		5.4
	631R	6.000	24.19	20.13		2.25		.25	11,200	43.0		7.2
	631R	6.000	24.19	20.13		2.31		.31	11,200	48.6		9.0
	610R	6.000	24.81	20.44		2.88		.38	14,900	59.6		10.8
Style A OBR Aprons[4]	961R	9.000	28.06	14.75	22.56	2.88	4.00	.25	18,000	115.2	2.9	8.3
	2397R	12.000	27.25	15.19	21.81	3.75	4.00	.25	18,400	92.5	2.6	7.5
	1706R	12.000	28.06	14.75	22.56	3.75	4.00	.25	28,000	108.7	2.6	7.5
	2614R	12.000	27.69	14.19	22.06	4.25	4.00	.25	35,000	157.1	2.6	7.5
	2614R	12.000	27.69	14.19	22.06	4.38	4.00	.38	35,000	172.4	4.0	11.3
Style A FRS	961R	9.000	19.25	14.75 max.		2.88	4.00	.25	18,000	61.5	2.9	8.3
	2614R	12.000	19.75	14.19 max.		4.38	4.00	.38	35,000	76.6	4.0	11.3
Style B Aprons	603R	6.000	23.69	20.75	20.13	1.06	3.50	.19	7,000	40.5	3.0	5.4
	625R	6.000	24.63	21.16	20.31	1.06	3.50	.19	8,300	43.4	3.0	5.4
	625R	6.000	24.63	21.16	20.31	1.13	3.50	.25	8,300	48.8	3.0	7.2
	625R	6.000	24.63	21.16	20.31	1.19	4.00	.31	8,300	55.6	3.0	9.0
	B-663R	6.000	26.38	22.13	21.13	1.13	3.50	.25	14,400	56.0	4.6	7.2
	B-663R	6.000	26.38	22.13	21.13	1.19	4.00	.31	14,400	63.2	4.6	9.0
	B-963R	9.000	26.38	22.13	21.13	1.38	4.00	.25	14,400	56.7	4.6	7.1
	B-963R	9.000	26.38	22.13	21.13	1.44	4.00	.31	14,400	60.0	4.6	8.2
	B-963R	9.000	26.38	22.13	21.13	1.75	4.00	.38	14,400	67.3	4.6	10.6
	B-964R	9.000	26.88	22.44	21.19	1.44	4.00	.31	18,400	66.7	4.2	8.2
	B-964R	9.000	26.88	22.44	21.19	1.75	5.00	.38	18,400	78.1	4.2	10.6
	B-1263R	12.000	26.38	22.13	21.13	1.38	4.00	.25	14,400	53.1	3.8	7.0
	B-1263R	12.000	26.38	22.13	21.13	1.44	4.00	.31	14,400	58.3	3.8	8.8
	B-1263R	12.000	26.38	22.13	21.13	1.75	4.00	.38	14,400	63.6	3.8	10.5
	B-1264R	12.000	26.88	22.44	21.19	1.44	4.00	.31	18,400	61.5	3.8	8.8
	B-1264R	12.000	26.88	22.44	21.19	1.75	5.00	.38	18,400	70.6	3.8	10.5
Style D Aprons	625R	6.000	24.63	21.16	20.31	1.06	3.50	.19	8,300	43.4	3.0	5.4
	625R	6.000	24.63	21.16	20.31	1.13	3.50	.25	8,300	48.8	3.0	7.2
	625R	6.000	24.63	21.16	20.31	1.19	4.00	.31	8,300	55.6	3.0	9.0
	B-963R	9.000	26.38	22.13	21.13	1.38	4.00	.25	14,400	56.7	4.6	7.1
	B-963R	9.000	26.38	22.13	21.13	1.44	4.00	.31	14,400	60.0	4.6	8.2
	B-963R	9.000	26.38	22.13	21.13	1.75	4.00	.38	14,400	67.3	4.6	10.6
	B-964R	9.000	26.88	22.44	21.19	1.44	4.00	.31	18,400	66.7	4.2	8.2
	B-964R	9.000	26.88	22.44	21.19	1.75	5.00	.38	18,400	78.1	4.2	10.6
	B-1263R	12.000	26.38	21.13	21.13	1.38	4.00	.25	14,400	53.1	3.8	7.0
	B-1263R	12.000	26.38	21.13	21.13	1.44	4.00	.31	14,400	58.3	3.8	8.8
	B-1263R	12.000	26.38	21.13	21.13	1.75	4.00	.38	14,400	63.6	3.8	10.5
	B-1264R	12.000	26.88	22.44	21.19	1.44	4.00	.31	18,400	61.5	3.8	8.8
	B-1264R	12.000	26.88	22.44	21.19	1.75	5.00	.38	18,400	70.6	3.8	10.5

[1]All widths and weights are based on 18" apron pan widths. For weight est. refer to "Approximate Weight (lbs.)" column for your specific conveyor width.

[2]Indicates working load for two strands of chain.

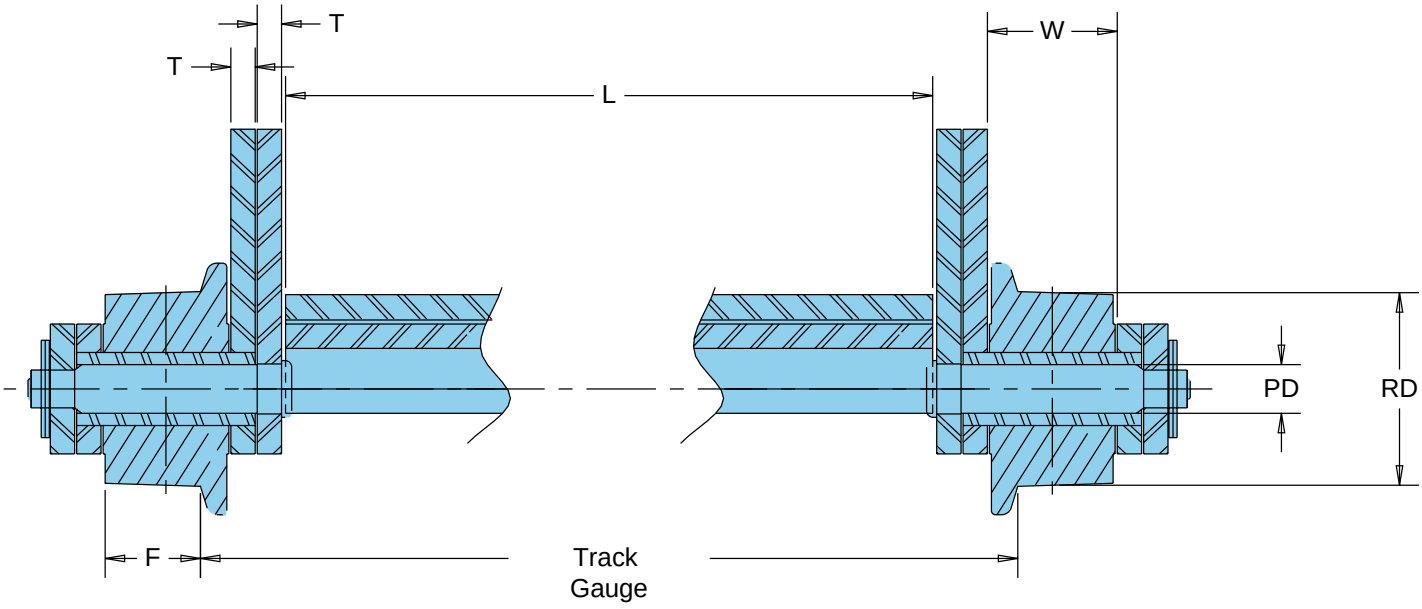
[3]Indicates without through-rods. Refer to page A-42 for rod weights.

[4]OBR style can be furnished stub shaft every pitch or every 2nd pitch depending on load criteria. All weights shown above are for OBR every pitch. Consult with Union engineers for selection assistance.

To locate compatible sprockets for your chain, refer to the Product Cross-Reference in Section D.

Note: Dimensions are subject to change. Contact Union Chain to obtain certified prints for design and construction.

Apron Conveyor Dimensions



Apron Conveyor Dimensions for Chain with Single Flange Rollers Styles B & D Conveyors

Center to Center of chain = L + 4T + W + 3/16"
Track Gauge = L + 4T + 2k + 1/2"
Center to Center of sprocket = L + 4T + 2k + F + 1/4"
Overall Width = L + 8T + 2W + 2c + 1/4"

Where:

L = Length of apron

T = Thickness of sidebars (chain dimension)

W = Inside width (chain dimension)

F = Width or face of roller tread

k = Constant for diameter of roller

c = Constant for diameter of pin

Values of F and k

Roller Diam. RD	F	k
2.50	.88	.31
3.00	1.09	.41
3.00	1.25	.31
3.50	1.25	.56
4.00	1.25	.59
4.00	1.50	.59
5.00	1.75	.66
5.00	1.75[1]	.72
6.00	1.88	.69
6.00	1.88[1]	.81

[1]Indicates heavier wheel of same width of roller tread.

Values of c

Pin Diam. PD	c
.56	.41
.63	.47
.75	.56
.88	.56
1.00	.69
1.13	.69
1.25	.69
1.50	.81

Apron Weights/Each Unassembled

All dimensions are in inches unless otherwise indicated.

Pitch	Thickness	Approximate Weight (lbs.)											
		18"	24"	30"	36"	42"	48"	54"	60"	66"	72"	78"	84"
3.000[1]	.19	4.3	5.7	7.2	8.6	10.0	11.5	12.9	14.3	15.7	17.2	18.6	20.0
4.000[1]	.19	5.8	7.7	9.6	11.5	13.4	15.3	17.3	19.2	21.1	23.0	24.9	26.8
4.000[1]	.25	7.7	10.2	12.7	15.3	17.8	20.4	23.0	25.5	28.0	30.6	33.2	35.7
4.000[1]	.31	9.6	12.8	16.0	19.2	22.4	25.6	28.8	31.9	35.1	38.3	41.5	44.7
4.000[1]	.38	11.5	15.3	19.1	23.0	26.8	30.6	34.4	38.3	42.0	45.9	49.8	53.6
6.000	.19	8.1	10.8	13.5	16.4	19.0	21.7	24.4	27.1	29.8	32.5	35.2	38.0
6.000	.25	10.8	14.5	18.1	21.7	25.3	28.9	32.6	36.2	39.8	43.5	47.0	50.6
6.000	.31	13.6	18.1	22.6	27.1	31.6	36.2	40.7	45.2	49.7	54.2	58.8	63.3
6.000[1]	.38	16.3	21.7	27.2	32.5	38.0	43.4	48.7	54.2	59.6	65.0	71.5	76.0
6.000[1]	.50	21.7	28.9	36.1	43.4	50.6	57.9	65.0	72.3	79.4	86.6	93.9	101.0
9.000	.19	12.0	16.0	20.0	24.0	28.0	32.0	36.0	40.0	44.0	48.0	52.0	56.0
9.000	.25	16.0	21.2	26.6	31.9	37.2	42.5	47.9	53.2	58.5	63.8	69.0	74.5
9.000	.31	18.4	24.6	30.7	36.9	43.0	49.1	55.3	61.5	67.6	73.8	80.0	86.1
9.000	.38	23.9	31.9	39.8	47.8	55.8	63.7	71.7	79.7	87.7	95.7	103.6	111.6
12.000[2]	.19	15.8	21.0	26.3	31.6	37.9	42.1	47.4	52.6	58.0	63.2	68.5	73.8
12.000[2]	.25	21.1	28.1	35.1	42.1	49.1	56.1	63.1	70.1	77.1	84.1	91.1	98.1
12.000[2]	.31	26.3	35.1	43.9	52.6	61.4	70.2	79.0	87.7	96.5	105.2	113.9	122.7
12.000[2]	.38	31.6	42.2	52.7	63.2	73.8	84.4	94.8	105.2	115.9	126.3	136.9	147.5

[1]Style A aprons only.

[2]Style B aprons only.

Steel Pan Ends

Separate Steel Pan Ends Approximate Weight (lbs.)						
Chain Pitch	Thick. of Ends	Unassembled Height of End Above Center Line of Chain				
		2"	3"	4"	5"	6"
3.000	.19	.7	.8	.9	1.0	1.3
4.000	.19	.6	.8	1.3	1.5	1.7
4.000	.25	.8	1.1	1.7	2.0	2.3
6.000	.19	1.0	1.3	1.8	2.1	2.4
6.000	.25	1.4	1.9	2.4	2.9	3.3

Through-Rod Weights

Approximate Weight/Through-Rods (lbs.)								
Chain Pin Dia.	Distances Between Centers							
	18"	24"	30"	36"	42"	48"	54"	60"
.63	1.6	2.1	2.6	3.0	3.7	4.2	4.7	5.2
.75	2.3	3.0	3.8	4.5	5.3	6.0	6.8	7.5
.88	3.1	4.1	5.1	6.1	7.1	8.1	9.1	10.1
1.00	4.0	5.4	6.7	8.0	9.4	10.7	12.0	13.4
1.13	5.1	6.8	8.5	10.2	11.8	13.5	15.2	16.9
1.25	6.3	8.4	10.4	12.5	14.6	16.7	18.8	21.9
1.50	9.0	12.0	15.0	18.0	21.0	24.0	27.0	30.0

Note: Through-rods are made from high carbon steel. The portions of the ends that act as chain pins are heat-treated for wear resistance.

SELECTION GUIDELINES

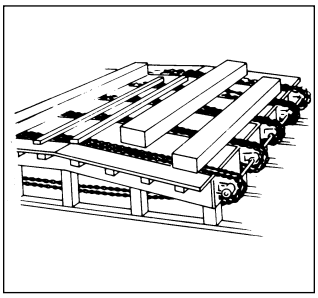
A wide variety of chains are available for the purpose of material handling, conveying, and elevating. An accurate assessment of the basic conditions in which the chain will function is essential for optimum performance. In general, the basic steps of conveyor chain selection are as follows:

- Select a conveyor type appropriate for the material being handled.
- Choose the chain type best suited for the conveyor style selected and the material being handled.
- Select the specific chain size necessary to successfully handle the loading conditions of the conveyor, attachment spacing, space limitations, and other service conditions that are encountered.

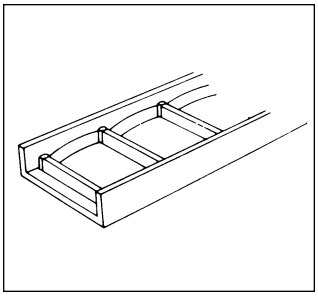
Union Chain Division Conveying and Elevating Chains are built to withstand challenging operating conditions including shock loadings and exposure to environments conducive to abrasive wear and/or corrosion. In some more severe applications, special materials or heat treatments are required for successful performance. If you have any questions, contact Union engineering for assistance in making the best choice for your conveying application.

Conveyor Types

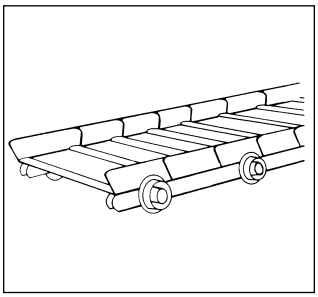
There are, in general, nine types of chain conveyors. The material being handled and the service environment typically determine which type is chosen.



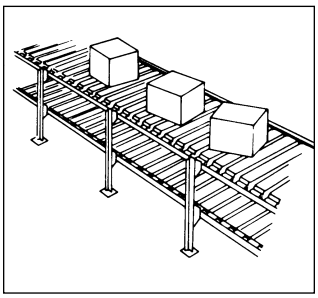
Plain Chain
The chain runs in tracks and the load is carried directly on the chain.



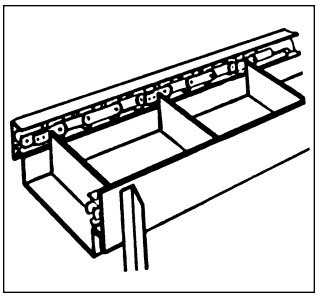
Drag Conveyors
One or more endless strands with or without integral flights moves material in a trough or pan.



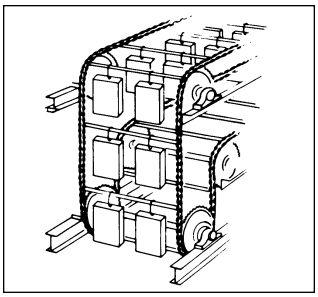
Apron Conveyors
Die formed steel plates or pans mounted on two or more strands of chain. They are good for impact, abrasion and high temperature applications.



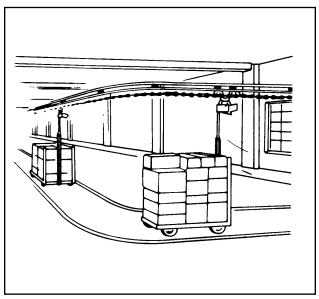
Slat Conveyors
Two or more strands of chain with slats attached at intervals. This is used primarily for unit handling.



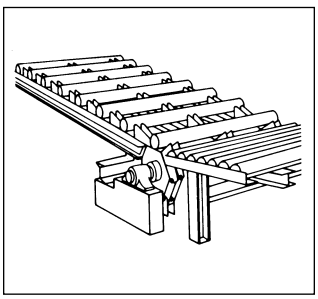
Scraper Flight
One or two endless chains with flights attached to push material in a trough.



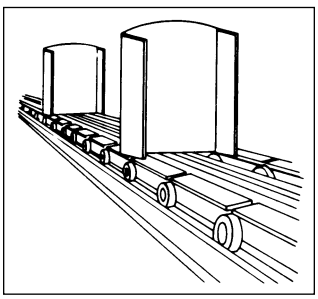
Cross Bar
Two strands of chain connected by cross-bars, which can be arranged in paths from inclined to serpentine.



Trolley and Tow
An endless strand of chain is suspended from an overhead track with carrying attachments at intervals. Tow conveyors have pickups to engage truck masts.



Pusher Chain
One or more strands of endless chain are utilized with attachments to push the load. Load slides or rolls on rails. The chain does not carry the load.



Carrier Chain
Attachments are connected to part of the chain and form a carrying surface for an individual part on a continuous surface.

Material Classifications

- Bulk materials (example: limestone)
- Unit materials (example: TV sets)

Table 1 — Typical Material Classifications of Conveyor Types

Conveyor Type	Bulk[1]	Unit[2]
Plain Chain		X
Drag Conveyors	X	
Apron Conveyors	X	
Slat Conveyors		X
Scraper Flight	X	
Cross Bar		X
Trolley and Tow		X
Pusher Chain		X
Carrier Chain		X

[1]Bulk material capacities are typically given as tons per hour (TPH).

[2]Unit material capacities are typically given as pieces (or units) per hour (pcs./hr.)

General Conveyor Chain Types

- Roller Conveyor Chains
- Steel Bushed Rollerless
- Welded Steel Mill Chain
- Welded Steel Drag Chain
- Cast Combination Chain
- Drop Forged Rivetless Chain
- Bar/Pin Chain

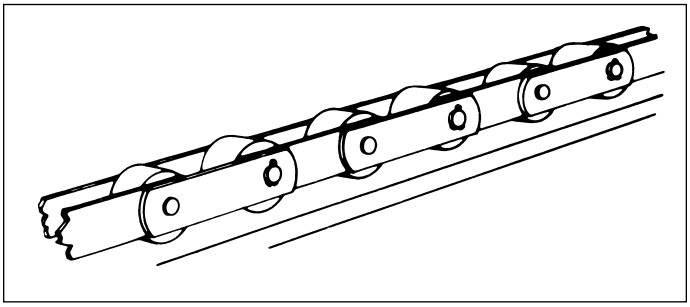
Table 2 — Typical Chain Types for Conveyor Service

Conveyor Types	Conveyor Chain Types						
	Roller Conveyor	Steel Bushed	Welded Steel	Welded Drag	Cast Combination	Drop Forged	Bar/Pin
Plain Chain	X	X	X	X	X		X
Drag Conveyors		X	X	X	X		
Apron Conveyors	X						
Slat Conveyors	X						
Scraper Flight	X	X	X		X	X	X
Cross Bar	X						
Trolley and Tow						X	X
Pusher Chain	X	X	X	X	X		X
Carrier Chain	X						

Table 3 — General Characteristics of Conveyor Chain Types

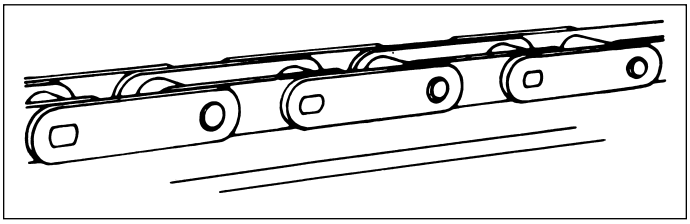
Chain Type	Pitch Range (in.)	Weight Range (lbs./ft.)	Working Loads (lbs.)	Operating Speeds (fpm)	Wear Life Rating
Roller Conveyor	1.654 to 24.0	3.7 to 35.0	2,100 to 22,300	10 to 200	A
Steel Bushed	2.609 to 7.0	3.8 to 67.0	2,750 to 21,800	10 to 150	B
Welded Steel	2.609 to 6.05	4.0 to 30.0	3,000 to 15,300	10 to 100	C
Welded Drag	5.0 to 8.0	12.0 to 29.0	8,500 to 15,000	10 to 100	C
Cast Combination	2.609 to 6.05	3.6 to 16.3	2,340 to 10,400	10 to 75	D
Drop Forged	3.031 to 9.031	2.2 to 10.0	1,100 to 21,600	10 to 75	C
Bar/Pin	4.0 to 12.0 (Avg.)	5.2 to 33.0	—	10 to 50	C

Chain Rolling or Sliding



Chain Rolling

- Best suited when chain carries materials.
- Smoother operation, less pulsation.
- Less friction — allows longer centers, smaller motors, and lower operating costs.
- Less horsepower required.
- Not suited for "dirty" applications where foreign materials can jam rollers.



Chain Sliding

- Best suited when conveyor deck supports materials and chains carry, push, drag or scrape.
- Rugged construction — ideal for impact loadings.
- Greater horsepower required.
- Works well in "dirty" applications because this chain has fewer moving parts.

Friction Coefficients

Table 4 — Sliding Friction Coefficients (f_s)

	Dry	Lubricated
Chains on Steel Rail	.33	.20
Chains on Bronze	—	.15
Chains on Hardwood	.35	.25
Chains on UHMW Plastic	.25	.15
Cast Iron on Steel	.50	.30

Table 5—Sliding Friction of Materials on Steel Troughs (f_s)

Material	Friction	Material	Friction	Material	Friction
Aluminum	.40	Coal, Bituminous, Run of Mine	.60	Lime, Ground	.40
Ashes Dry < 3"	.50	Coal, Bituminous, Slack, Dry	.50	Lime, Pebble	.50
Ashes Wet < 3"	.60	Coal, Bituminous, Slack, Wet	.70	Sand, Dry	.60
Bagasse	.40	Coke, Sized	.40	Sand, Foundry, Shakeout	.70
Beans, Whole	.35	Coke, Mixed	.60	Sand, Foundry, Tempered	.85
Cement, Portland	.65	Coke, Breeze	.65	Sawdust	.40
Cement, Clinker	.70	Cottonseed	.35	Stonedust	.50
Coal, Anthracite	.30	Grains	.40	Stone, Screened Lumps	.60
Coal, Anthracite, Run of Mine	.40	Gravel, Dry, Screened	.45	Stone Lumps and Fines	.65
Coal, Anthracite, Pea	.45	Gravel, Run of Bank	.60	Wood Chips	.40
Coal, Anthracite, Buckwheat	.55	Ice, Crushed	.20		
Coal, Bituminous, Sized	.55	Ice Cakes	.10		

Table 6 — Approximate Rolling Friction Coefficients (f_r)

Roller O.D.	Dry	Lubricated
1 1/2	.22	.16
2	.20	.15
2 1/2	.16	.12
3	.14	.09
4	.12	.08
5	.11	.07
6	.10	.06

Roller Bearing f_r = .05
Ball Bearing with hardened race f_r = .03

Specific Rolling Friction Coefficients (f_r)

$$f_r = \frac{d}{D} f_s$$

Where:

D = O.D. of chain roller (in.)
d = O.D. of chain bushing (in.)
f_S = Sliding friction coefficient from Table 4

Table 7 — Maximum Speeds of Conveyor Chains (fpm)

All dimensions are in inches unless otherwise indicated.

Number of Teeth	Pitch				
	4	6	9	12	18
6	180	145	120	105	85
7	210	170	140	120	100
8	240	195	160	140	115
9	270	220	180	155	125
10	300	245	200	175	140
11	330	270	220	190	155
12	360	295	240	205	170
13	390	320	260	225	185
14	420	345	280	240	200
15	450	365	300	260	210

For economical speeds when conveyors are heavily loaded and the load is carried over the terminal sprockets use 75% of above values.

Table 8 — Allowable Roller and Bushing Bearing Pressures

Roller and Bushing Materials	Allowable Bearing Pressure (PSI)	
	Dry	Lubricated
Case Hardened Steel and Case Hardened Steel	700	1,400
Case Hardened Steel and Through-Hardened Steel	700	1,400
Case Hardened Steel and Untreated Steel	500	1,200
Case Hardened Steel and Chrome Iron	500	1,100
Case Hardened Steel and Chilled Iron	600	1,000
Case Hardened Steel and Bronze	200	400
Case Hardened Steel or Stainless Steel on Plastic	100	150

Engineering Formulas

Material Weight per ft. on Conveyor (M) for Bulk Materials (lbs./ft.)

$$M = \frac{(33.3)\ (Q)}{S}$$

$$M = \frac{(CFM)\ (d)}{S}$$

Where:

Q = Capacity (tons/hr.)

S = Chain speed (ft./min.)

CFM = Capacity or conveyed material flow rate ($ft.^3$/min.)

d = Material density ($lbs./ft.^3$)

Chain Speed (S)

$$S = \frac{(P)\ (N)\ (RPM)}{12}$$

Where:

S = Speed (ft./min.)

P = Chain pitch (in.)

N = Number of teeth in sprocket

RPM = Rotational speed of sprocket

Horsepower (HP)

$$HP = \frac{(t)\ (rpm)\ (1.1)}{63{,}025}$$

$$HP = \frac{(T)\ (rpm)\ (1.1)}{5{,}252}$$

$$HP = \frac{(P)\ (S)\ (1.1)}{33{,}000}$$

Where:

t = Torque transmitted by headshaft (in./lb.)

T = Torque transmitted by headshaft (ft./lb.)

rpm = Speed of headshaft

P = Total conveyor pull (lbs.)

S = Chain Speed (ft./min.) (Note: 1.1 compensates for motor efficiency.)

Estimated Chain Weight for Selection (lbs./ft.*)

- For Chain Rolling: Chain Weight = (.002) (M) (C)
- For Chain Sliding: Chain Weight = (.004) (M) (C)

Where:

M = Weight of material being conveyed on conveyor (lbs./ft.)

C = Center distance between sprockets

* = Weight of each strand without slats

To locate compatible sprockets for your chain, refer to the Product Cross-Reference in Section D.

Note: Dimensions are subject to change. Contact Union Chain to obtain certified prints for design and construction.

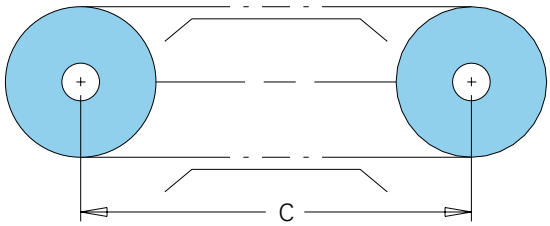
Conveyor Chain Pull Formulas

Horizontal

Material Carried: (Slat or Apron Conv.) $P = (2.1W + M)\, f_r C$

Material Sliding: (Drag or Scraper Conv.) $P = (2.1Wf_S + Mf_S)\, C + J$

Horizontal



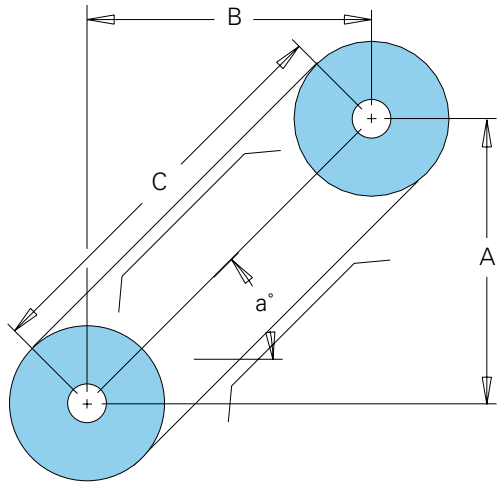
Inclined

Material Carried: (Slat or Apron Conv.) $P = [(M + W)\, f_r\, COSa + (M + W)\, SINa]\, C + (Wf_r COSa - WSINa)\, C + J$

Material Sliding: (Scraper Conv.) $P = [(Mf_S + Wf_S)\, COSa + (M + W)\, SINa] + J$

Note: *When $(Wf_r COSa - WSINa)\, C$ is positive, multiply quantity by 1.1 to account for tail shaft friction.*

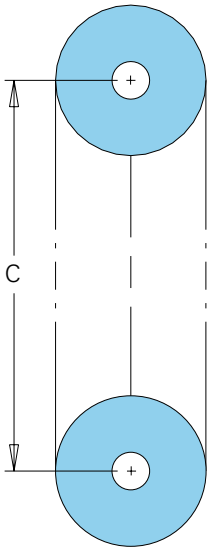
Inclined



Vertical

Material Carried: $P = (M + W)\, C + \frac{P_1}{2}$

Vertical



Glossary

- P = Total Conveyor Pull (lbs.)
- P_1 = Take-up Force (lbs.)
- W = Weight of chains, attachments, slats, etc., and other moving elements of the conveyor per ft. (lbs./ft.)
- M = Weight of material per ft. on the conveyor (lbs./ft.)
- f_r = Friction coefficient of chain rolling on support rail (Table 6)
- f_S = Sliding friction coefficient of material or chain sliding (Tables 4 and 5)
- C = Center distance (ft.)
- J = Pull (lbs.) caused by sideboard sliding friction (Table 9)

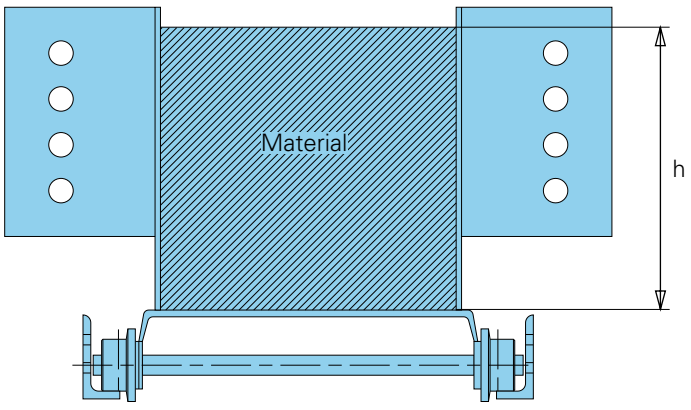
Table 9 — Additional Pull on Conveyor (J)
Material Sliding Against Sideboards

Material	R
Coal	14.0
Coke	35.0
Limestone	7.5
Gravel	7.0
Sand	5.5
Ashes	14.0

$J = \frac{Ch^2}{R}$ $\quad SINa = \frac{A}{C}$ $\quad COSa = \frac{B}{C}$

Where:

- h = Height of material in inches
- R = Variable factor for different materials
- C = Length of conveyor in feet



Selection Procedure

Step 1: Determine the Conveyor's Basic Requirements

- Type of conveyor to be used and layout of its dimensions (C, a, etc.).
- Type of chain including attachments.
- Determine weight of conveyed material (M) on the conveyor (lbs./ft.).
- Estimate weight of chain, attachments, and other moving parts of conveyor (W) (lbs./ft.).
- Friction Coefficients (Tables 4–6).
- Conveyor speed (S) (ft./min.).
- Determine pull due to sideboard friction (J).
- Determine service factor (V) from Table 10.

Step 2: Calculate Conveyor Pull

Use the appropriate formula from page A-48 to determine conveyor pull (P).

Step 3: Select Sprocket Size

Using Table 11, under conveyor speed read down to the number nearest 1.00 (this will be in the vicinity of the heavy dividing line). Read across to the left to obtain the optimum sprocket size. If space limitations require using smaller sprockets read across from the right from the number of teeth to the column under conveyor speed — obtain the Speed Correction Factor (E).

Step 4: Calculate Design Conveyor Pull (DP)

DP = (P) (V) (E)

Step 5: Calculate Chain Tensions (T)

- Single strand conveyor — T = DP
- Double strand conveyor — T = (DP) (1.2) /2
- Triple strand conveyor — T = (DP) (1.2) /3
- More than three strands — Consult Union Engineering

Step 6: Select Chain Size

Choose a chain that has a maximum allowable load rating greater than the calculated chain tension of Step 5.

Step 7: Recalculate Actual Chain Tension

Repeat Steps 2–5 using actual chain weights. For roller conveyor chains, specific rolling friction coefficient values can be obtained from Table 6 on page A-46.

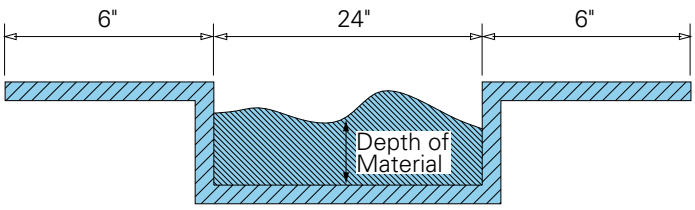
Step 8: Check Roller/Bushing Bearing Pressure (Roller Conveyor Chain Only)

Calculate bearing pressure from:

$$\text{Bearing Pressure} = \frac{\text{Maximum Load per Roller (lbs.)}}{\text{Bushing OD (in.) x Roller Length (in.)}}$$

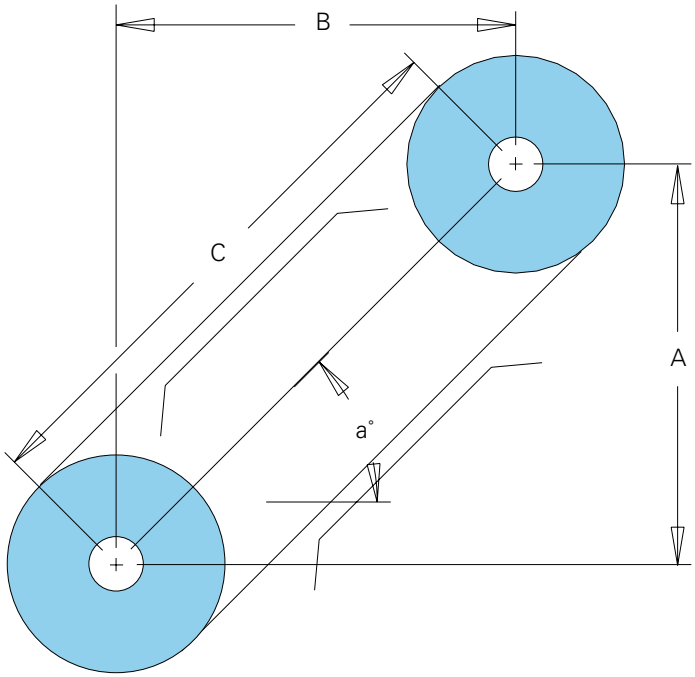
This value should be less than that shown in Table 8.

Selection Example



An incline scraper conveyor has been tentatively selected to handle bituminous coal. The sketch above shows the steel trough; other details are given below:

- Operating capacity: Q = 150 ton/hr.
- Operating speed: S = 100 ft./mn.
- Depth of material: d = 6"
- Total lift: A = 30 ft.
- Total horizontal run: B = 40 ft.
- Sprocket centers: C = 50 ft.
- Infrequent moderate shock
- 24-hour operation—"Dirty" conditions
- Scraper paddle: 5/16" x 12" x 23"—22.8 lbs. each, spaced every 12."
- Use roller conveyor chain



Selection Chain Pull Factors

Table 10 — Service Factors (V)

Frequency of Shock	Character of Conveyor Loading	Conditions of Operation	Daily Operating Period
Infrequent (1)	Uniform or Steady (1)	Relatively clean and moderate room temperature (1)	8–10 hours (1)[1]
	Moderate Shock (1.2)[1]	Moderately dusty (1.2)	
Frequent (1.2)[1]	Heavy Shock (1.5)	Unprotected from weather, dirty corrosive conditions or unusual temperatures within permissible operating range (1.4)[1]	24 Hours (1.2)

[1]Example V = 1.2 x 1.2 x 1.4 x 1.0 = 2.02

Table 11 — Speed Correction Factors (E)

All dimensions are in inches unless otherwise indicated.

	Conveyor Speed (ft./min.)														
Teeth	**10**	**25**	**50**	**75**	**100**	**125**	**150**	**175**	**200**	**225**	**250**	**275**	**300**	**400**	**500**
6	.92	1.09	1.37	1.68	2.00	2.40	2.91	3.57	4.41	5.65	7.35	10.60	16.70		
7	.86	.97	1.13	1.27	1.44	1.61	1.81	2.04	2.29	2.60	2.96	3.42	3.95	8.62	
8	.81	.91	1.04	1.16	1.26	1.37	1.49	1.63	1.76	1.93	2.10	2.29	2.48	3.62	6.21
9	.79	.87	.98	1.07	1.17	1.26	1.36	1.45	1.55	1.65	1.76	1.88	2.00	2.56	2.94
10	.78	.84	.94	1.02	1.09	1.16	1.24	1.31	1.37	1.45	1.53	1.61	1.68	2.03	2.41
11	.76	.82	.90	.97	1.03	1.09	1.15	1.22	1.28	1.34	1.40	1.46	1.52	1.78	2.05
12	.74	.79	.86	.93	.99	1.05	1.10	1.16	1.21	1.26	1.32	1.37	1.42	1.63	1.84
14	.74	.77	.83	.89	.94	.98	1.02	1.07	1.11	1.15	1.19	1.24	1.28	1.47	1.61
16	.73	.76	.81	.86	.89	.94	.97	1.01	1.05	1.08	1.12	1.16	1.19	1.34	1.48
18	.72	.75	.80	.83	.88	.91	.94	.98	1.01	1.04	1.08	1.11	1.14	1.27	1.40
20	.72	.75	.79	.83	.86	.89	.92	.95	.98	1.01	1.04	1.07	1.10	1.22	1.34
24	.71	.74	.77	.80	.82	.85	.88	.90	.94	.96	.98	1.01	1.04	1.15	1.26

Conveyor Selection Example

Step 1: Determine the Conveyor's Basic Requirements

- Incline scraper conveyor
- Roller conveyor chain with attachment for flight every 12".
- Determine (M) from formula on page A-47.

$$M = \frac{33.3\ (Q)}{S} = \frac{33.3\ (150)}{100}$$

$M = 50$ lbs./ft.

- Determine W:

$W = (CW)\ (N) + Ws$

CW = Wt. of Chain (lbs./ft.)
N = No. of chain strands = 2
Ws = Wt. of slats = 22.8 lbs./ft.

From formula on page A-47.

For Chain Rolling	For Chain Sliding
CW = .002 (M) (C)	CW = .004 (M) (C)
CW = .002 (50) (50)	CW = .004 (50) (50)
CW = 5.00 lbs./ft. (very light duty rolling)	CW = 10.00 lbs./ft. (sliding)

From Table 3 note that minimum chain weight = 3.70 lbs./ft., so use the 5.00 value rather than the 3.70 (lbs./ft.)

For Chain Rolling	For Chain Sliding
W = (5.00) (2) + 22.8	W = 10.00 (2) + 22.8
W = 32.8 lbs./ft. (rolling)	W = 42.8 lbs./ft. (slide)

Friction Coefficients
From Table 5:
$f_S = .55$ (Sliding Coal)

From Table 6:
$f_r = .20$ (Rolling Chain)

- Conveyor Speed:
(s)= 100 ft./min.

- Determine Sideboard Friction (J) from Table 9:

$$J = \frac{Ch^2}{R}$$

$$J = \frac{50\ (6)^2}{14}$$

$J = 128$ lbs.

- Determine Service Factor (V) from Table 10:
$V = (1.0)\ (1.2)\ (1.4)\ (1.2)$
$V = 2.02$

Step 2: Calculate Conveyor Pull (P)

From formula on page A-48.

For Chain Rolling

$P = [(Mf_S + Wf_r)\ COSa + (M + W)\ SINa]\ C + (Wf_r\ COSa - W\ SINa)\ C$
$P = [((50)\ (.55) + (32.8)\ (.2))\ .8 + (50 + 32.8)\ .6]\ 50 + [(32.8)\ (.2)\ (.8) - 32.8\ (.6)]\ 50$
$P =$ 3,850 lbs. - 720 lbs.
$P =$ 3,130 lbs. (rolling)

For Chain Sliding

$P = [(Mf_S + Wf_S)\ COSa + (M + W)\ SINa]\ C + (Wf_S\ COSa - W\ SINa)\ C$
$P = [(50)\ (.55) + (42.8)\ (.33)\ .8 + (50 + 42.8)\ .6]\ 50 + [(42.8)\ (.33)\ (.8) - 42.8\ (.6)]\ 50$
$P =$ 4,450 lbs. - 720 lbs.
$P =$ 3,730 lbs. (sliding)

Step 3: Select Sprocket Size

From Table 11 we obtain 12-tooth sprocket as best selection choice.

$E = .990$

Step 4: Calculate Design Conveyor Pull (DP)

For Chain Rolling	For Chain Sliding
DP = (P) (V) (E)	DP = (P) (V) (E)
DP = (3130) (2.02) (.99)	DP = (3,730) (2.02) (.99)
DP = 6,260 lbs. (rolling)	DP = 7,460 lbs. (sliding)

Step 5: Calculate Chain Tension

For Chain Rolling	For Chain Sliding
T = (DP) (1.2)/2	T = (DP) (1.2)/2
T = (6,260) (1.2)/2	T = (7,460) (1.2)/2
T = 3,760 lbs. (rolling)	T = 4,480 lbs. (sliding)

Step 6: Select Chain Size

For Chain Rolling

Referring to page A-32, G-29 or G-19 attachments are convenient for bolting scraper flights. Since attachment spacing is every 12", choose either 4", 6", or 12" pitch chain.

Select 1131R with G-29 every 2nd pitch.

For Chain Sliding

Note that chain U-3945 with K-3 attachments every 3rd pitch could suit this application. In addition, mining industry chains should be considered. Choose the chain that offers the best overall economy.

Select U-3945 with K-3 attachments every third pitch. (See Asphalt Batch Plants and Finishing in the Selected Industry Applications Section.)

Step 7: Recalculate Chain Tension

For Chain Rolling

W = 22.8 + 13.9
W = 36.7 lbs./ft.
f_r = .33 (1.125/3)
f_r = .12
DP = 2,960 (2.02) (.99)
DP = 5,920 lbs.
T = 5,920 lbs. (1.2)/2
T = 3,550 lbs./strand (rolling)

Since the maximum allowable working load rating of 1131R is 5,900 lbs., the selection is satisfactory. We could, however, economize by selecting a smaller chain (for example, 627R). To do this, recalculate chain tension by repeating Steps 2, 3, 4, and 5.

For Chain Sliding

W = 22.8 + 9.8
W = 32.6
f_S = .33 (Sliding Steel)
f_S = .55 (Sliding Coal)
DP = 3,720 (2.02) (.99)
DP = 7,440 lbs.
T = 7,440 lbs. (1.2)/2
T = 4,460 lbs./strand (sliding)

Since the maximum allowable working load rating of U-3945 is 5,740 lbs., the selection is satisfactory. If bolted flight attachments are not necessary, mining industry chain could be considered.