

# SPECIALTY/MADE-TO-ORDER ATTACHMENTS

## Chain Descriptions and Dimensions

Can't find a standard attachment to fit your needs? Give us a call and we'll design one for you. We've designed literally thousands of attachments over our 100-year history and we're more than happy to design one to fit your needs. In fact, some of our stock attachments were born from custom orders just like yours.

Diamond custom-designs chains to fit your exact needs. First, we search through our vast collection of designs to see if one currently exists that satisfies your requirements. Using or adapting an existing design not only improves economy, but it also increases our responsiveness to your needs. If we can't find an existing design that will work, we'll design one that will. Then we add your design to our list so if you ever need to re-order, the design is ready and waiting.

For every custom order our application and design engineers are involved from the very beginning. These engineers review the application, propose solutions and then monitor the chain through its design and production. They'll even advise you of any special considerations and maintenance procedures to make sure your custom chain is one of the longest lasting chains you own.

To make the custom-design process easier, the following pages display dozens of attachments that may be suitable for your application. Use these designs as a starting point and look for features, or the exact attachment, that will satisfy your requirements. When designing or specifying attachment chains, consider the following information to avoid problems with either installation or performance:

**Standard Attachments:** Standard attachments described in the standard attachment section of this guide are normally much less expensive than special designs.

**Link Plate Location:** Attachments are normally less expensive when assembled on the pin link rather than on the roller link.

**Modifications:** Attachment link plates are specifically designed and heat treated to permit further operations by the user such as drilling, reaming, and tapping if desired. At no time should attachment links be modified by welding because the heat applied can adversely affect the heat treatment of the steel, resulting in either reduced performance or failure.

**Extended Pins:** Extended pins, made from medium carbon steel, are specially heat treated for ductility and toughness and can be easily assembled at virtually any spacing. It is important to note that if pairs of extended pins are specified, they must be located in a common pin link. In some applications this may require the use of an offset in the cycle.

Diamond does not recommend using "shouldered pins." They are generally expensive to manufacture and can often compromise quality due to high stress concentrations at the point where diameters change. Additions of sleeves or bearings on the extended pins will often yield a more dependable design and at a lower cost.

Dimensions in Inches

Chain Size	Hole Diameter	Screw Size	Screw Diameter
25	.102	#3	.099
35	.094	#2	.086
40	.125	#5	.125
41	.125	#5	.125
50	.203	#10	.190
60	.203	#10	.190
80	.250	¼	.250
100	.312	⅝	.312
120	.375	¾	.375
140	.438	7/16	.438
160	.500	½	.500

Dimensions in Inches

Chain Size	Hole Diameter*	Screw Size	Screw Diameter
C2040	.125	# 5	.125
C2050	.203	#10	.190
C2060H	.203	#10	.190
C2080H	.266	¼	.250
C2100H	.328	⅝	.312
C2120H	.391	¾	.375
C2160H	.516	½	.500

\*Straight, one hole attachments have larger diameters than shown. Refer to Double-Pitch Straight and Bent Attachment tables for more detail.

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## Chain Descriptions and Dimensions

**Attachment Hole Sizes:** If your application requires a different attachment hole than shown in this section, please contact Diamond, as alternate lug holes may be available.

**Assembly:** While it is possible to purchase base chain or attachment components and construct an attachment chain, it is strongly recommended that chains be ordered and assembled at the factory to ensure the proper fit and alignment of all parts, along with any length or matching requirements.

### Manufacturing Length Tolerance

ASME/ANSI defines the permissible length of an assembled section of roller chain. The allowable length tolerances vary from model to model and are also affected by the chain's construction, i.e., with or without attachments.

As an example, the assembled length tolerance for an ASME/ANSI one inch pitch chain (#80) is  $+.016"/-.000"$  per foot. When attachments are added to the chain's design, the tolerance for length expands to  $+.032"/-.000"$  per foot. This means that a section of #80 chain 12 pitches long (12" nominal) can measure as long as 12.016" but *no less than* 12.000". The same section of chain assembled with bent, straight, or extended pin attachments could measure as long as 12.032" but again, *no less than* 12.000".

Commonly, manufacturers strive to produce chain nearer to the nominal figure but the maximum allowable over length tolerance should always be considered when designing for take-ups and catenary chain sag. If the application requires, some design/assembly steps can be taken to direct the length of the chain toward the nominal; however, on a routine basis machine designs based on a nominal or specified chain length should be avoided.

### Length Matching of Roller Chains

Many applications require two or more chains, normally with attachments, to run in parallel with "flights" joining the chains together forming a conveyor or transfer type system. In these cases it is critical to have the chains ordered as a set, matched for length and installed on the machinery with the same relationship to one another as when they were manufactured.

Diamond offers two degrees of matching for parallel operation: Class I and Class II.

**Class I** - A Class I match assures that the longest and the shortest chain in a given set will not vary in overall length by more than .006"/ft. Again using #80 chain as an example, the length of two #80 chains 120 pitches long will not vary by more than .060" in overall length ( $10\text{ft.} \times .006"/\text{ft.} = .060"$ ). The shortest could measure  $120" + .000"$  (remember, no negative tolerance) and the longest could measure up to  $120" + .060"$  and satisfy the Class I requirement. Class I matching is most often accomplished by assembling the chains from selected lots of component parts.

**Class II** - A Class II match is much more stringent and assures that the longest and the shortest chain in a given set will not vary in overall length by more than .002"/ft. Applying this new tolerance to the above example, the length of two #80 chains 120 pitches long will not vary by more than .020" in overall length ( $10\text{ft.} \times .002"/\text{ft.} = .020"$ ). The shortest could measure  $120" + .000"$  and the longest could measure  $120" + .020"$  and satisfy the requirement. Class II matching is quite difficult and requires some very unique procedures.

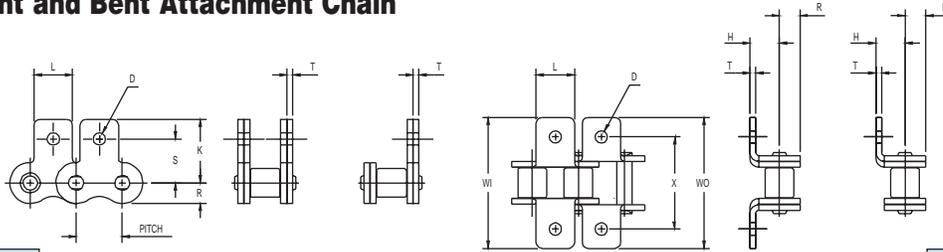
**Differences** - It is important to remember that matched chains still fall under the overall length limitations imposed by either ASME/ANSI or the manufacturer. Matching *does not* assure the user of chains with a finite overall length, only that the chains in the set have a controlled relationship to one another.

If you ever have any questions, give us a call. We're always glad to help.

# SPECIALTY/MADE-TO-ORDER ATTACHMENTS

## Chain Descriptions and Dimensions

### Standard Straight and Bent Attachment Chain



Others	Diamond
M-35, SA1	S1 (one hole)
M-1, SK1	S2 (one hole)

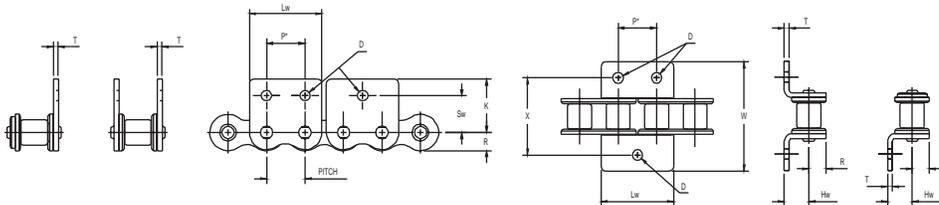
Others	Diamond
A1	B1 (one hole)
K1	B2 (one hole)

Dimensions in Inches

ASME/ANSI Number	Pitch Inches	D	H	K	L	R Max.	S	T	WI	WO	X
25	.250	.125	.180	.451	.218	.119	.308	.030	.781	.843	.562
35	.375	.102	.250	.577	.312	.178	.387	.050	1.125	1.125	.750
40	.500	.141	.312	.684	.375	.238	.489	.060	1.390	1.390	1.000
41	.500	.141	.282	.698	.375	.192	.482	.050	1.375	1.375	.937
50	.625	.203	.406	.895	.500	.297	.618	.080	1.812	1.812	1.250
60	.750	.203	.478	1.038	.625	.356	.716	.094	2.135	2.135	1.500
80	1.000	.266	.625	1.339	.750	.475	.968	.125	2.750	2.750	2.000
100	1.250	.343	.784	1.696	1.000	.594	1.233	.156	3.077	3.406	2.500
120	1.500	.386	.917	2.024	1.125	.713	1.424	.187	3.841	4.239	2.995
140	1.750	.448	1.127	2.445	1.375	.831	1.750	.220	4.361	4.826	3.500
160	2.000	.516	1.250	2.756	1.500	.950	2.007	.250	5.078	5.609	4.000

Above attachments available for multiple strand chain.

### Wide Contour Straight and Bent Attachment Chain



Others	Diamond	Others	Diamond
WM-35	WCS1 (one hole)	WM-1	WCS2 (one hole)
WM-35-2	WCS1 (two holes)	WM-2	WCS2 (two holes)

Others	Diamond	Others	Diamond
WA-1	WCB1 (one hole)	WK-1	WCB2 (one hole)
WA-2, A2	WCB1 (two holes)	WK-2, K2	WCB2 (two holes)

Dimensions in Inches

ASME/ANSI Number	Pitch Inches	D	Hw	K	Lw	P	R Max.	Sw	T	W	X
*35	.375	.125	.262	.577	.727	.375	.178	.399	.050	1.105	.750
*40	.500	.141	.326	.684	.946	.500	.238	.503	.060	1.366	1.000
*41	.500	.141	.282	.698	.878	.500	.192	.482	.050	1.372	.937
*50	.625	.203	.406	.895	1.211	.625	.297	.618	.080	1.807	1.250
*60	.750	.203	.478	1.038	1.420	.750	.356	.716	.094	2.135	1.500
*80	1.000	.266	.625	1.339	1.885	1.000	.475	.967	.125	2.750	2.000
*†100	1.250	.343	.784	1.696	2.362	1.250	.594	1.233	.156	3.408	2.500
*†120	1.500	.386	.917	2.023	2.836	1.500	.713	1.424	.187	4.239	2.995

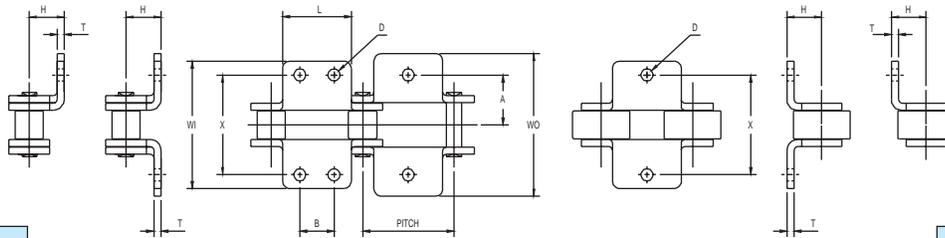
\* Attachment available on pin link plate only.  
 † These items not available with 48-hour delivery.

Contact Diamond Chain for available attachments on roller links (wide contour).  
 Above attachments available for multiple strand chain.

# SPECIALTY/MADE-TO-ORDER ATTACHMENTS

## Chain Descriptions and Dimensions

### Double-Pitch Bent Attachments Oval Contour Link Plates Standard and Oversized Roller



Others	Diamond
A1	B1 (one hole)
A2	B1 (two holes)

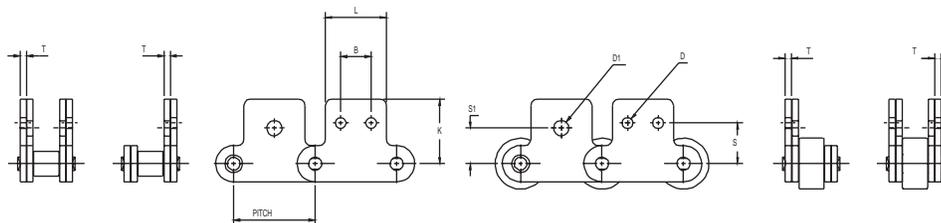
Others	Diamond
K1	B2 (one hole)
K2	B2 (two holes)

Dimensions in Inches

<b>Standard Roller</b>		Pitch Inches	A	B	D	H	L	T	WI	WO	X	<b>Large Roller</b>	
ASME/ANSI #	Roller Diam.											ASME/ANSI #	Roller Diam.
*C2040	.312	1.00	.500	.375	.141	.359	.750	.060	1.350	1.483	1.000	C-2042	.625
*C2050	.400	1.25	.625	.469	.203	.453	.937	.080	1.692	1.863	1.250	C-2052	.750
*C2060H	.469	1.50	.844	.562	.203	.578	1.125	.125	2.171	2.446	1.688	C-2062H	.875
*C2080H	.625	2.00	1.094	.750	.266	.766	1.500	.156	2.792	3.125	2.188	C-2082H	1.125
*C2100H	.750	2.50	1.312	.937	.328	.922	1.875	.187	3.554	3.951	2.625	C-2102H	1.562
*C2120H	.875	3.00	1.562	1.125	.391	1.095	2.250	.219	4.318	4.782	3.125	C-2122H	1.750
*C2160H	1.125	4.00	2.063	1.500	.516	1.438	3.000	.281	5.520	6.116	4.125	C-2162H	2.250

\*Two attachment holes stock.  
 One attachment hole made-to-order.

### Double-Pitch Straight Attachments Oval Contour Link Plates Standard and Oversized Roller



Others	Diamond
M-35, SA1	S1 (one hole)
M-35-2, SA2	S1 (two holes)

Others	Diamond
M-1, SK1	S2 (one hole)
M-2, SK2	S2 (two holes)

Dimensions in Inches

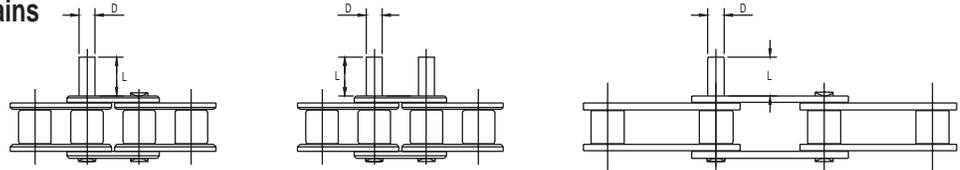
<b>Standard Roller</b>		Pitch Inches	With Two* Attachment Holes			K	L	T	With One Attachment Hole		<b>Large Roller</b>	
ASME/ANSI #	Roller Diam.		B	D	S				D1	S1	ASME/ANSI #	Roller Diam.
*C2040	.312	1.00	.375	.141	.531	.773	.750	.060	.188	.438	C-2042	.625
*C2050	.400	1.25	.469	.203	.625	.971	.937	.080	.250	.563	C-2052	.750
*C2060H	.469	1.50	.562	.203	.750	1.203	1.125	.125	.329	.688	C-2062H	.875
*C2080H	.625	2.00	.750	.266	1.000	1.590	1.500	.156	.375	.875	C-2082H	1.125
*C2100H	.750	2.50	.937	.328	1.250	1.982	1.875	.187	.516	1.125	C-2102H	1.562
*C2120H	.875	3.00	1.125	.391	1.469	2.367	2.250	.219	.563	1.312	C-2122H	1.750
*C2160H	1.125	4.00	1.500	.516	2.000	3.090	3.000	.281	.750	1.750	C-2162H	2.250

\*Two attachment holes stock.  
 One attachment hole made-to-order.

# SPECIALTY/MADE-TO-ORDER ATTACHMENTS

## Chain Descriptions and Dimensions

### Standard Extended Pins For ASME/ANSI Standard Series Chains and Double-Pitch Conveyor Chains

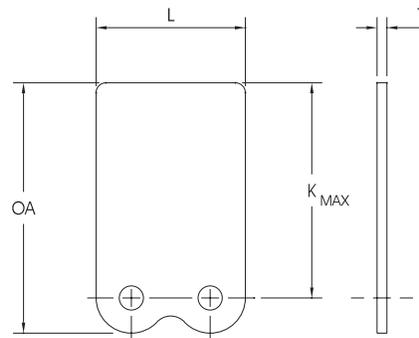


Others	Diamond
D1	E1 (one extended pin)
D3	E2 (two extended pins)

Dimensions in Inches

ASME/ANSI #	Pitch Inches	D $\pm$ .0005"	L $\pm$ .010"	ASME/ANSI #	Pitch Inches	D $\pm$ .0005"	L $\pm$ .010"	ASME/ANSI #	Pitch Inches	D $\pm$ .0005"	L $\pm$ .010"
35	.375	.141	.375	80	1.00	.312	.750	C-2040, C-2042	1.00	.156	.375
40	.500	.156	.383	100	1.25	.375	.937	C-2050, C-2052	1.25	.200	.468
41	.500	.141	.375	120	1.50	.437	1.125	C-2060H, C-2062H	1.50	.234	.562
50	.625	.200	.468	140	1.75	.500	1.312	C-2080H, C-2082H	2.00	.312	.750
60	.750	.234	.562	160	2.00	.562	1.500	C-2100H, C-2102H	2.50	.375	.937

### Wide-Tail Lugs



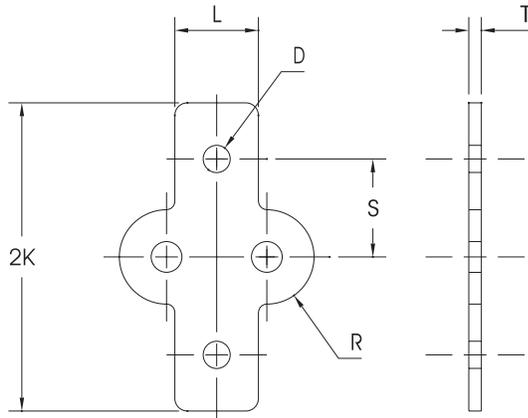
Dimensions in Inches

ASME/ANSI #	Pitch Inches	K (max.)	L	OA	T
35	$\frac{3}{8}$	1.290	.713	1.459	.050
40	$\frac{1}{2}$	1.560	.971	1.796	.060
41	$\frac{1}{2}$	1.560	.878	1.749	.050
50	$\frac{5}{8}$	1.810	1.209	2.103	.080
60	$\frac{3}{4}$	2.049	1.420	2.384	.094
80	1	2.485	1.885	2.930	.125
100	$1\frac{1}{4}$	2.927	2.362	3.483	.156

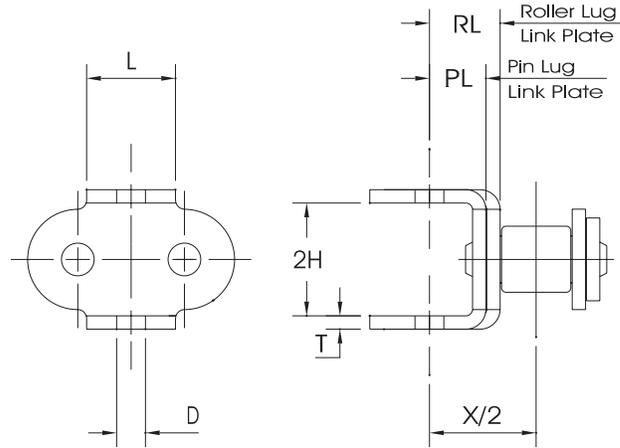
# SPECIALTY/MADE-TO-ORDER ATTACHMENTS

## Chain Descriptions and Dimensions

### Double Straight Lugs



### Double Bent Lugs



Dimensions in Inches

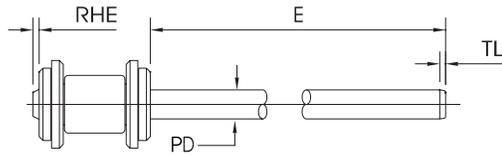
ASME/ ANSI #	Pitch Inches	D	2H	2K	L	PL	RL	R	S	T	X/2
40	1/2	.133	.524	1.567	.375	.219	.281	.236	.502	.060	.500
41	1/2	.133	.453	1.478	.375	.237	.291	.189	.476	.050	.469
50	5/8	.164	.660	1.962	.500	.268	.354	.293	.626	.080	.625
60	3/4	.203	.794	2.306	.625	.303	.401	.353	.733	.094	.750
80	1	.257	1.016	3.142	.750	.424	.556	.445	.991	.123	1.000
100	1 1/4	.320	1.265	3.905	1.000	.545	.710	.556	1.248	.156	1.250

Consult Diamond Chain for extended pitch chain, double straight and double bent attachment availability.

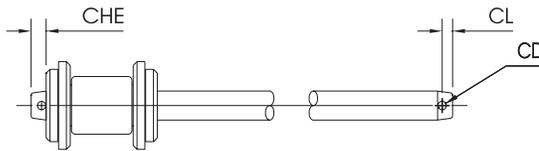
# SPECIALTY/MADE-TO-ORDER ATTACHMENTS

## Chain Descriptions and Dimensions

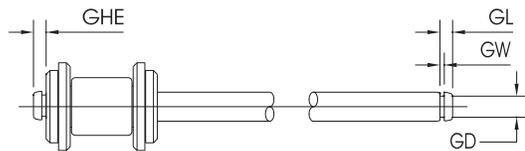
### Extended Pins



Standard Design  
Plain End Extended



Available  
Made-to-Order



Available  
Made-to-Order

### Medium Carbon Steel

Dimensions in Inches

ASME/ANSI Number	Pitch Inches	CD	CHE	CL	E MAX.	E STD.	GD	GHE	GL	GW	PD	RHE	TL
25	1/4	....	....	....	.83	.250	.065	.055	.055	.027	.090	.022	.027
35	3/8	.060	.108	.078	2.56	.375	.105	.072	.072	.032	.141	.032	.029
40	1/2	.060	.108	.078	2.88	.383	.121	.083	.083	.034	.156	.032	.029
41	1/2	.060	.108	.078	2.50	.370	.108	.076	.076	.034	.141	.032	.029
50	5/8	.067	.116	.082	6.50	.468	.146	.096	.096	.036	.200	.040	.032
60	3/4	.067	.121	.084	10.00	.562	.171	.108	.108	.038	.234	.050	.042
80	1	.103	.182	.131	10.30	.750	.228	.134	.134	.040	.312	.063	.055
100	1 1/4	.115	.204	.132	10.00	.937	....	....	....	....	.375	.081	.079
120	1 1/2	.127	.225	.153	16.00	1.125	....	....	....	....	.437	.085	.083
140	1 3/4	.141	.254	.168	13.80	1.312	....	....	....	....	.500	.099	.085
160	2	.157	.283	.189	11.63	1.500	....	....	....	....	.562	.105	.093
200	2 1/2	.250	.450	.320	6.57	1.875	....	....	....	....	.781	.133	.120
C2060H	1 1/2	.067	.121	.084	9.75	.562	....	....	....	....	.234	.050	.042
C2080H	2	.103	.182	.131	10.00	.750	....	....	....	....	.312	.063	.055

### Stainless

Dimensions in Inches

Diamond Number	Pitch Inches	CD	CHE	CL	E. MAX.	E. STD.	GD	GHE	GL	GW	PD	RHE	TL
25 SS	1/4	....	....	....	.52	.250	.064	.055	.055	.028	.090	.022	.016
35 SS	3/8	.052	.093	.067	.90	.375	.103	.076	.076	.034	.141	.032	.029
40 SS	1/2	.067	.112	.078	1.25	.383	.121	.083	.083	.034	.156	.032	.031
41 SS	1/2	.052	.093	.067	.85	.375	.103	.076	.076	.034	.141	.032	.029
50 SS	5/8	.067	.112	.078	1.50	.468	.600	.096	.096	.036	.200	.040	.040
60 SS	3/4	.067	.121	.087	1.90	.562	.170	.102	.102	.035	.234	.051	.042
80 SS	1	.101	.182	.131	3.50	.750	....	.134	....	....	.312	.069	.065