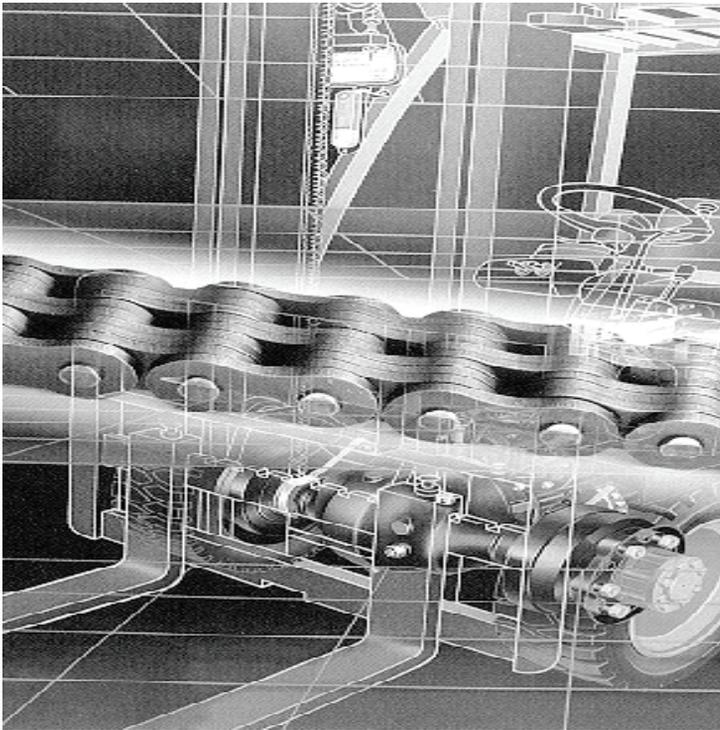


# Chain Identification & Chain Gauge Instruction Manual



# Four (4) - Part Chain Awareness Training Program

## 1. Chain Identification

Training on identification of leaf chain type and correct method of measuring chain lengths.

## 2. Using the Chain Wear Gauge

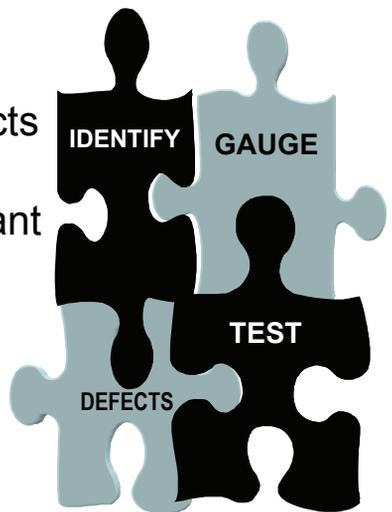
Instruction on using a Chain Gauge to measure chain elongation (stretch) as recommended by the chain manufacturer.

### Other Chain Defects

Summary of other chain defects that may appear in the field, which would warrant replacement.

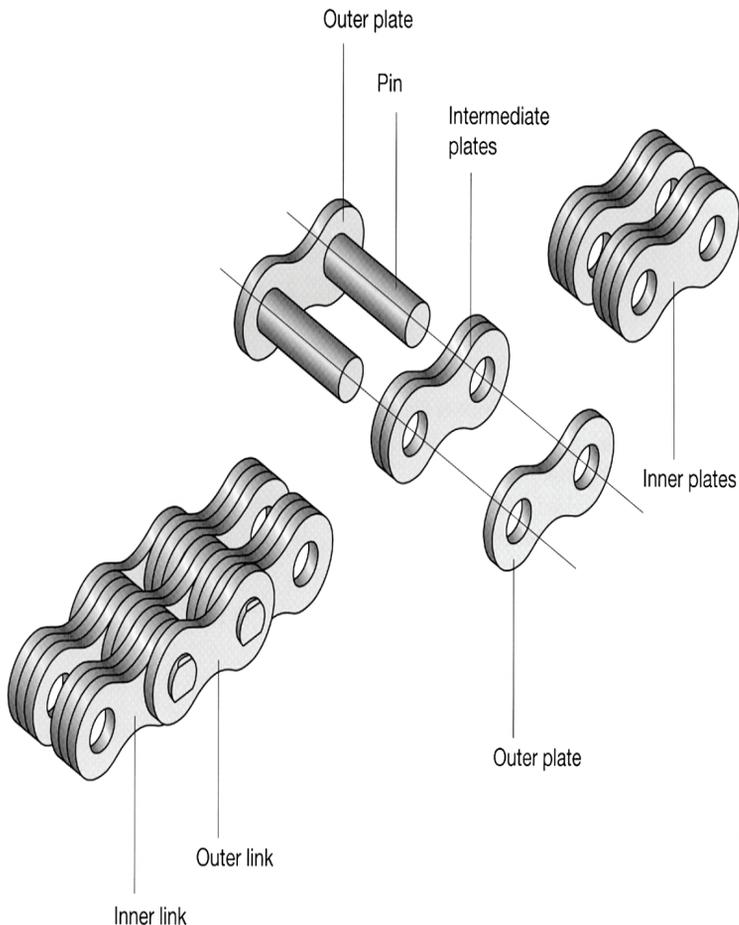
### Practical Test

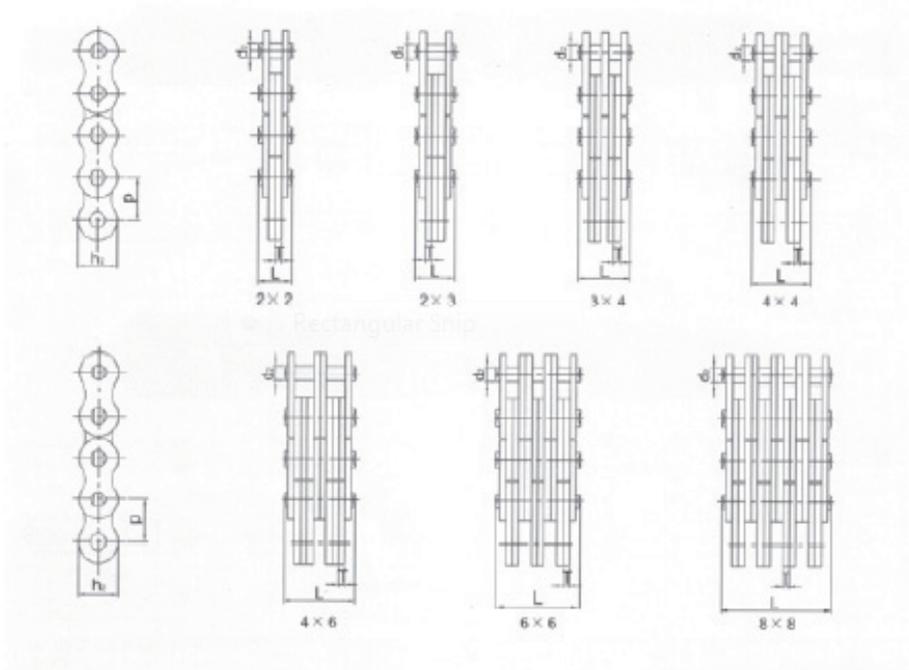
Find some chain in the workshop and test the gauge, make sure to ask if you need more assistance.



# 1. Chain Identification

Leaf chain is made up of riveted pins, press fit and intermediate slide fit plates. It has inner links and outer link just like roller chain but no rollers & bushes as shown in the below cross section.

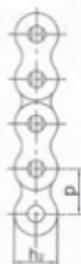




3 Simple steps – not 2!

- **PITCH:**  
Dimension of the centre to the centre of the pin see P above
- **LACING:**  
Plate configuration as shown above
- **PIN DIAMETER:**  
Diameter of pin.  
Still in doubt? Check the side plates – 90% of chains are stamped or just check thickness against the dimensions in the following American and European standard leaf chains.

# American Standard Leaf Chain



2 × 2



2 × 3



3 × 4



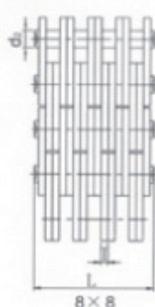
4 × 4



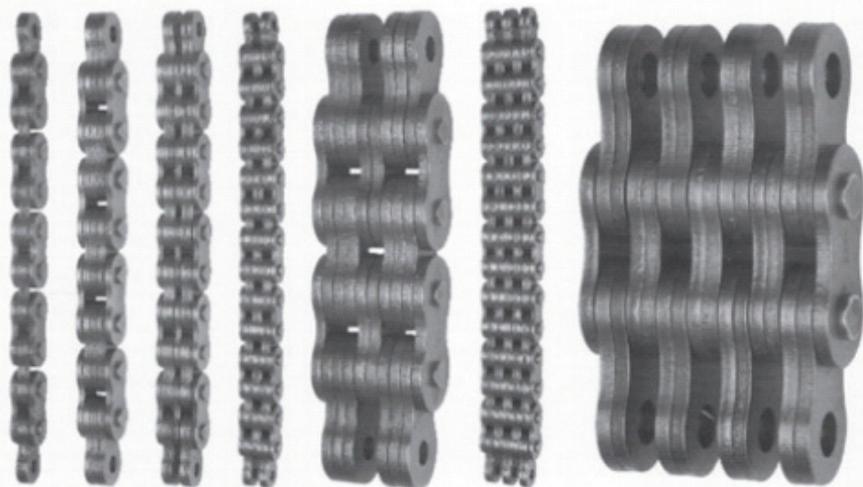
4 × 6



6 × 6



8 × 8



# *American Standard AL Series Leaf Chain*

ANSI Chain No.	Pitch	Plates lacing	Plate depth	Plate thickness	Pin diameter	Pin Length	Ultimate tensile strength	Average tensile strength	Weight per meter
	P		$h_2$ max	T	$d_2$ max	L max	Q min	$Q_0$	q =
	mm		mm	mm	mm	mm	mm	kN	kg/m
AL422	12.70	2 x 2	10.40	1.50	3.96	7.90	14.10	16.90	0.39
AL444		4 x 4				14.40	28.20	35.20	0.74
AL466		6 x 6				20.50	42.30	52.70	1.10
AL522	15.88	2 x 2	12.80	2.06	5.08	10.30	22.00	27.50	0.61
AL544		4 x 4				18.90	44.00	55.00	1.19
AL566		6 x 6				26.90	66.00	82.50	1.79
AL622	19.05	2 x 2	15.60	2.44	5.94	12.40	37.00	44.40	0.86
AL644		4 x 4				22.70	64.00	76.80	1.69
AL666		6 x 6				32.40	101.00	121.20	2.52
AL822	25.40	2 x 2	20.50	3.26	7.92	16.00	56.70	68.60	1.54
AL844		4 x 4				29.40	113.40	135.60	3.00
AL866		6 x 6				42.50	170.00	202.30	4.46
AL1022	31.75	2 x 2	25.60	4.00	9.53	19.60	88.50	107.10	2.37
AL1044		4 x 4				35.90	177.00	203.60	4.68
AL1066		6 x 6				52.30	265.00	315.80	7.00
AL1222	38.10	2 x 2	30.50	4.80	11.10	24.30	127.00	151.10	3.65
AL1244		4 x 4				43.80	254.00	299.70	7.05
AL1266		6 x 6				63.00	381.00	426.30	10.44
AL1422	44.45	2 x 2	36.40	5.65	12.70	28.07	151.23	182.37	4.79
AL1444		4 x 4				51.30	372.70	413.60	10.34
AL1466		6 x 6				74.56	559.00	620.40	15.16
AL1622	50.80	2 x 2	41.60	6.45	14.27	32.94	191.26	231.13	5.98
AL1644		4 x 4				58.06	471.00	522.80	12.98
AL1666		6 x 6				84.46	706.00	783.60	19.41

# American Standard BL Series Leaf Chain

ANSI Chain No.	Pitch	Plates lacing	Plate depth	Plate thickness	Pin diameter	Pin Length	Ultimate tensile strength	Average tensile strength	Weight per meter
	P		h <sub>2</sub> max	T	d <sub>2</sub> max	L max	Q min	Q <sub>0</sub>	q =
	mm		mm	mm	mm	mm	mm	kN	kg/m
BL422	12.70	2 x 2	12.07	2.08	5.09	11.05	22.20	27.60	0.64
BL423		2 x 3				13.16	22.20	27.60	0.8
BL434		3 x 4				17.40	33.40	41.40	1.12
BL444		4 x 4				19.51	44.50	56.00	1.28
BL446		4 x 6				23.75	44.50	56.00	1.60
BL466		6 x 6				27.99	66.70	81.70	1.92
BL488		8 x 8				36.45	89.00	109.40	2.56
BL522	15.88	2 x 2	15.09	2.44	5.96	12.9	33.40	42.80	0.88
BL523		2 x 3				15.37	33.40	42.80	1.10
BL534		3 x 4				20.32	48.90	63.60	1.50
BL544		4 x 4				22.78	66.70	84.50	1.80
BL546		4 x 6				27.74	66.70	84.50	2.20
BL566		6 x 6				32.69	100.10	125.10	2.65
BL588		8 x 8				42.57	133.40	169.50	3.50
BL622	19.05	2 x 2	18.11	3.30	7.94	17.37	48.90	63.60	1.45
BL623		2 x 3				20.73	48.90	63.60	1.80
BL634		3 x 4				27.43	75.60	102.60	2.50
BL644		4 x 4				30.78	97.90	122.30	2.90
BL646		4 x 6				37.49	97.90	122.30	3.60
BL666		6 x 6				44.20	146.80	190.80	4.30
BL688		8 x 8				57.61	195.70	238.80	5.80
BL822	25.40	2 x 2	24.13	4.09	9.54	21.34	84.50	108.20	2.20
BL823		2 x 3				25.48	84.50	108.20	2.70
BL834		3 x 4				33.76	129.00	143.60	3.80
BL844		4 x 4				37.90	169.00	214.60	4.30
BL846		4 x 6				46.18	169.00	214.60	5.40
BL866		6 x 6				54.46	253.60	324.50	6.50
BL888		8 x 8				71.02	338.10	432.70	8.60
BL1022	31.75	2 x 2	30.18	4.90	11.11	25.37	115.60	146.80	3.40
BL1023		2 x 3				30.33	115.60	146.80	4.30
BL1034		3 x 4				40.23	182.40	231.60	6.00
BL1044		4 x 4				45.19	231.30	291.40	6.90
BL1046		4 x 6				55.09	231.30	291.40	8.60
BL1066		6 x 6				65.00	347.00	430.30	10.30
BL1088		8 x 8				84.81	462.60	555.10	13.80

# American Standard BL Series Leaf Chain

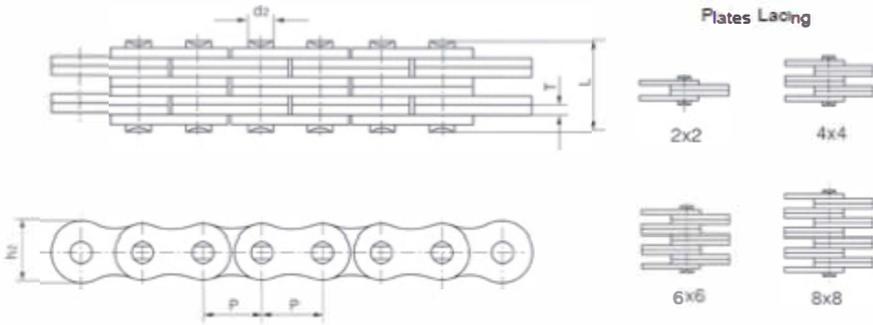
ANSI Chain No.	Pitch	Plates lacing	Plate depth	Plate thickness	Pin diameter	Pin Length	Ultimate tensile strength	Average tensile strength	Weight per meter
	P		$h_2$ max	T	$d_2$ max	L max	Q min	$Q_0$	q =
	mm		mm	mm	mm	mm	mm	kN	kg/m
BL1222	38.10	2 x 2	36.20	5.77	12.71	29.62	151.20	192.00	4.60
BL1223		2 x 3				35.43	151.20	192.00	5.80
BL1234		3 x 4				47.07	244.60	308.10	8.10
BL1244		4 x 4				52.88	302.50	381.10	9.30
BL1246		4 x 6				64.52	302.50	381.10	11.60
BL1266		6 x 6				76.15	453.70	543.60	13.90
BL1288		8 x 8				99.42	605.0	726.00	18.60
BL1422	44.45	2 x 2	42.24	6.55	14.29	33.55	191.30	225.70	6.10
BL1423		2 x 3				40.16	191.30	225.70	7.60
BL1434		3 x 4				53.37	315.80	372.60	10.60
BL1444		4 x 4				59.97	382.60	451.20	12.20
BL1446		4 x 6				73.18	382.60	451.20	15.20
BL1466		6 x 6				86.39	578.30	682.40	18.20
BL1488		8 x 8				112.8	765.10	902.80	24.30
BL1622	50.80	2 x 2	48.26	7.52	17.46	39.01	289.10	341.10	8.00
BL1623		2 x 3				46.58	289.10	341.10	10.00
BL1634		3 x 4				61.72	440.40	519.60	14.00
BL1644		4 x 4				69.29	578.30	680.40	16.00
BL1646		4 x 6				84.43	578.30	684.40	20.00
BL1666		6 x 6				99.57	857.40	1000.70	24.00
BL1688		8 x 8				129.84	1156.50	1364.60	32.00
BL2022	63.50	2 x 2	60.33	9.91	23.81	51.74	433.70	511.70	15.80
BL2023		2 x 3				61.70	433.70	511.70	19.80
BL2034		3 x 4				81.61	649.40	766.20	27.70
BL2044		4 x 4				91.57	867.40	1023.50	31.60
BL2046		4 x 6				111.48	867.40	1023.50	39.50
BL2066		6 x 6				131.39	1301.10	1535.20	47.40
BL2088		8 x 8				171.22	1734.80	2046.50	63.20

Pitch is  
right and  
Lacing's  
the same,  
but the  
pin is just  
out!



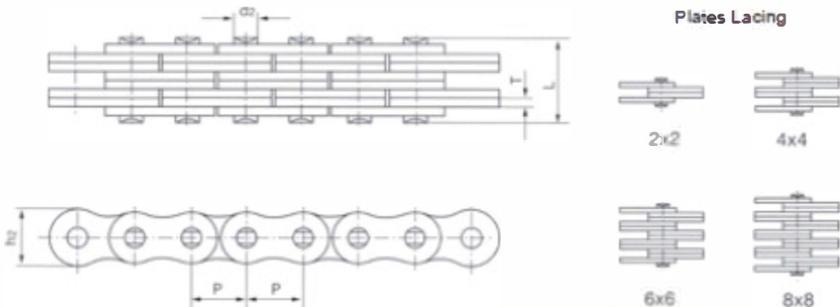
- You have just encountered a European Standard Chain which, if incorrectly identified, could be a costly exercise.
- Consult us immediately, as availability is not as good and pricing is much higher.
- Look out for SMV, Amiese, Manitowoc, Valmet, new Clark Omega and some Hyster with masts out of Europe.
- The LL Series chain are becoming more popular in our market now and availability is improving but identifying these incorrectly can be a costly mistake.

# European Standard Leaf Chains DIN



Chain No.	Pitch	Chain Lacing	Plate depth	Plate Thickness	Pin Diameter	Pin Length	Ultimate tensile strength	Average tensile strength	Weight per meter
	p		h2 max	T max	d2 max	L max	Q min	Q0	q
	mm		mm	mm	mm	mm	KN	KN	Kg/m
LL0822	12,700	2X2	10.60	1.30	4.45	7.6	17.8	20.4	0.35
LL0844		4X4				15.6	36.4	40.7	0.84
LL0866		6X6				18.2	44.5	50.9	1.00
LL0888		8X8				23.5	62.2	71.2	1.33
LL1022	15,875	2X2	13.70	1.60	5.06	9.2	22.3	25.5	0.54
LL1044		4X4				15.8	44.5	51.0	1.06
LL1066		6X6				22.1	66.7	76.3	1.57
LL1088		8X8				28.8	89.0	101.9	2.10
LL1222	19,050	2X2	15.00	1.85	5.72	10.4	28.9	33.2	0.73
LL1244		4X4				17.9	57.8	66.4	1.44
LL1266		6X6				25.4	86.7	99.7	2.15
LL1288		8X8				32.9	115.6	132.9	2.84

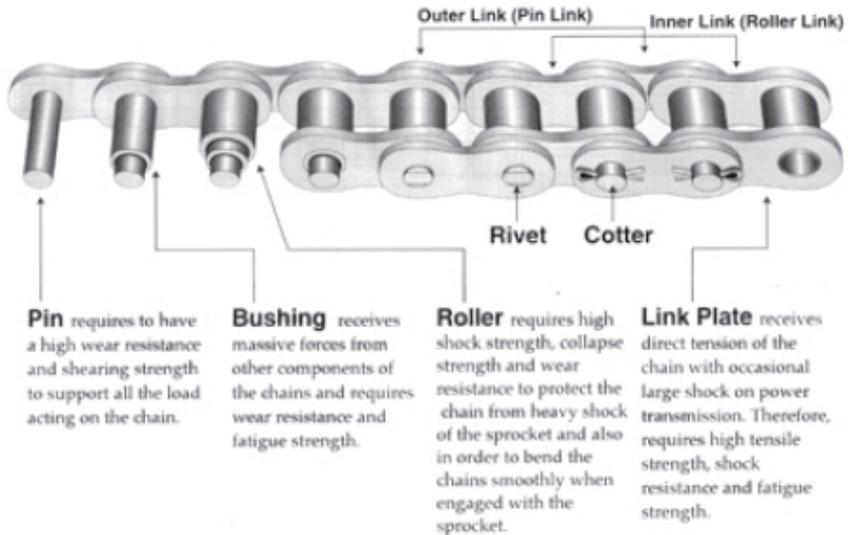
# European Standard Leaf Chains DIN



Chain No.	Pitch	Chain Lacing	Plate depth $h_2$ max	Plate Thickness $T$ max	Pin Diameter $d_2$ max	Pin Length $L$ max	Ultimate tensile strength $Q$ min	Average tensile strength $Q_0$	Weight per meter $q$			
	$P$									$Q$ min	$Q_0$	$q$
	mm									KN	KN	Kg/m
LL1622	25.400	2X2	21.00	3.10	8.28	17.2	58.0	66.7	1.52			
LL1644		4X4				29.6	116.0	140.0	2.90			
LL1666		6X6				42.4	174.0	208.8	4.30			
LL1688		8X8				55.4	232.0	278.0	5.71			
LL2022	31.750	2X2	26.40	3.70	10.09	20.1	95.0	109.2	2.33			
LL2044		4X4				35.4	190.0	218.5	4.40			
LL2066		6X6				50.1	285.0	324.6	6.79			
LL2088		8X8				65.1	380.0	435.1	8.90			
LL2422	38.100	2X2	33.20	5.00	14.63	28.4	170.0	195.5	4.47			
LL2444		4X4				46.3	340.0	380.8	8.22			
LL2466		6X6				66.4	510.0	571.2	12.22			
LL2488		8X8				86.6	680.0	775.2	16.30			
LL2822	44.450	2X2	37.08	6.00	15.90	32.2	200.0	224.0	5.10			
LL2844		4X4				56.4	400.0	448.0	9.90			
LL2866		6X6				80.8	600.0	672.0	14.80			
LL2888		8X8				105.2	800.0	896.0	19.40			
LL3222	50.800	2X2	42.00	6.00	17.81	33.2	260.0	291.2	5.80			
LL3244		4X4				56.6	520.0	582.4	12.30			
LL3266		6X6				80.8	780.0	873.6	18.30			
LL3288		8X8				105.0	1050.0	1176.0	24.00			
LL4022	63.500	2X2	52.76	8.25	22.89	44.7	360.0	403.2	10.30			
LL4044		4X4				77.9	780.0	873.6	20.00			
LL4066		6X6				111.1	1080.0	1209.6	30.00			
LL4088		8X8				145.5	1560.0	1747.2	39.10			
LL4822	76.200	2X2	63.88	10.30	29.24	56.1	560.0	627.2	18.50			
LL4844		4X4				97.4	1120.0	1254.4	35.70			
LL4866		6X6				138.9	1680.0	1881.6	53.00			
LL4888		8X8				182.4	2240.0	2508.8	70.40			

- **What if its not a leaf Chain**
- Roller chains are also commonly used on materials handling equipment for drive, steer and lifting application.

Roller chain consists of pins, bushings, rollers and link plates as illustrated below.



Just two extra steps – 5 to make sure its identified.

### **PITCH:**

Centre distance between pins (P)

### **Roller Diameter:**

Outside diameter of the roller (d1)

### **Roller Width**

Width across the roller between the inner roller link (b1)

### **Pin Diameter**

Diameter of pin (d2)

### **Side Plate thickness**

Thickness of the outer link (T)

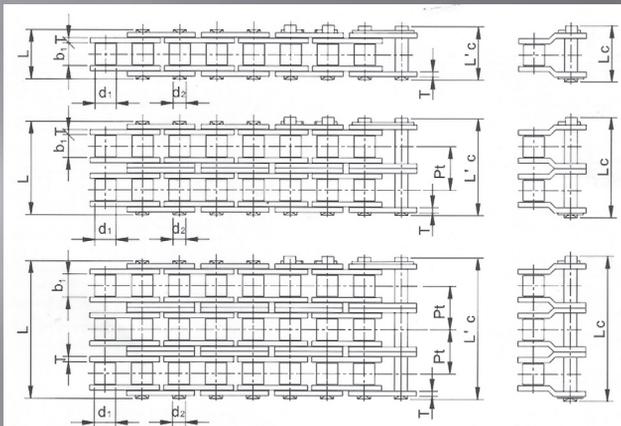
➤As with leaf chain check the side plate for the chain number, 90% of chains will be marked on the outer plate.

➤Roller chain can also come multi strands. The number of strands is added to the chain number to determine the correct part number of the chain.

-1 is single known as Simplex chain

-2 is double known as Duplex Chain

-3 is triple known as Triplex Chain



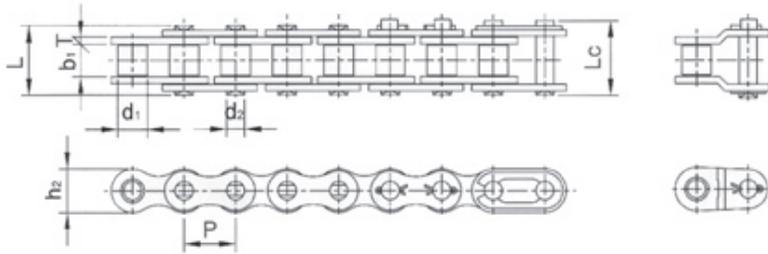
➤As with leaf chain there are 2 standards of roller chain – **American** and **British** (European). Dimensions and chain numbers are on the following 2 pages.

➤Often the machines origin will determine which standard of chain you will encounter but the dimensions still should be confirmed.

➤The American standard chains also come in a H Series in the Simplex chains. H Series have a thicker side plates to provide greater shock loading capacity found in tough drive chain applications

➤If you check all 3 dimensions and the side plate thickness is of the next pitch chain side up you have a H series chain. Refer to American Standard Heavy Duty Roller Chain spec page.

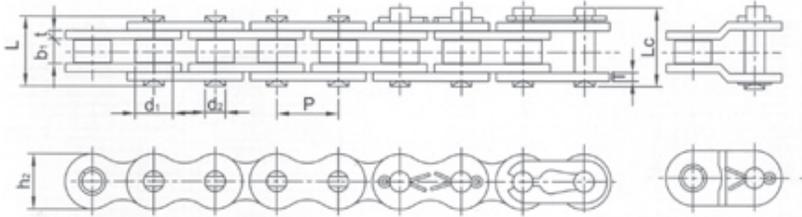
# American Standard Simplex Roller Chain



ANSI Chain No.	Pitch	Roller diameter	Width between inner plates	Pin diameter	Pin Length		Inner plate depth	Plate thickness	Ultimate tensile strength	Average tensile strength	Weight per meter
	P	d <sub>1</sub> max	b <sub>1</sub> min	d <sub>2</sub> max	L max	L <sub>c</sub> max	h <sub>2</sub> max	T	Q(ISO/DIN) min	Q <sub>o</sub>	q =
	mm	mm	mm	mm	mm	mm	mm	mm	kN	kN	kg/m
*25	6.35	3.30	3.10	2.31	8.00	9.90	6.02	0.80	3.50	4.40	0.14
*35	9.53	5.08	4.68	3.58	12.40	14.40	8.70	1.30	7.90	10.40	0.33
41	12.70	7.77	6.25	3.58	13.75	16.00	9.91	1.25	6.80	11.80	0.41
40	12.70	7.95	7.85	3.96	16.60	19.10	12.07	1.50	14.10	17.80	0.62
410	12.70	7.75	3.40	3.64	9.3	10.7	9.5	1.0	5.9	9.81	0.28
415	12.70	7.77	4.76	3.60	11.0	12.40	9.70	1.00	6.86	7.6	0.32
415H	12.70	7.77	4.76	3.96	13.1	14.50	12.00	1.50	14.40	16.1	0.55
50	15.88	10.16	9.40	5.08	20.70	23.30	15.09	2.06	22.20	28.00	1.02
60	19.05	11.91	12.57	5.94	25.90	28.60	18.08	2.44	31.80	39.00	1.50
80	25.40	15.88	15.75	7.92	32.70	38.00	24.13	3.26	56.70	71.50	2.60
100	31.75	19.05	18.90	9.53	41.10	44.90	30.18	4.00	88.50	102.00	3.91
120	38.10	22.23	25.22	11.10	50.80	56.10	36.20	4.80	127.00	156.90	5.62
140	44.45	25.40	25.22	12.70	54.90	60.80	42.24	5.65	172.40	210.80	7.50
160	50.80	28.58	31.55	14.27	65.50	72.60	48.26	6.45	226.80	269.70	10.10
180	57.15	35.71	35.48	17.46	72.80	83.00	54.31	7.25	280.20	327.80	13.45
200	63.50	39.68	37.85	19.85	80.30	90.50	60.33	8.00	353.80	410.00	16.15
240	76.20	47.63	47.35	23.81	95.50	106.00	72.39	9.50	510.30	585.40	23.20

\* Bush chain: d<sub>1</sub> indicate the external diameter of the bushing.

# British Standard (DIN) Simplex Roller Chain

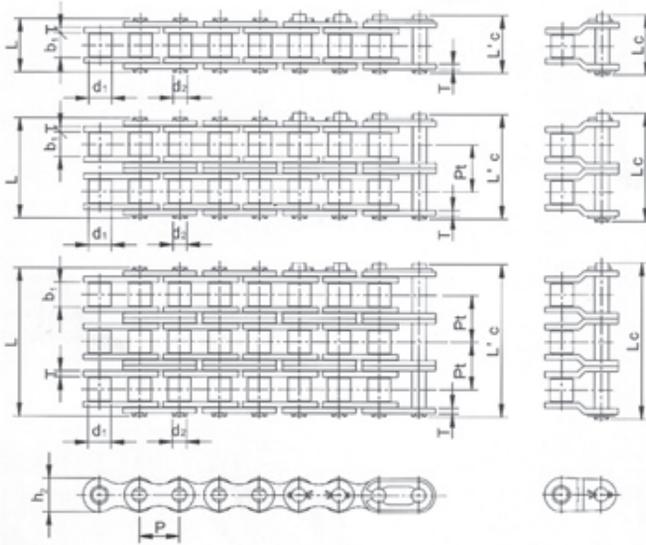


Chain No.	Pitch		Roller diameter		Width between inter plates		Pin diameter		Pin Length		Inner plate depth	Plate thickness	Ultimate tensile strength	Average tensile strength	Weight per meter
	p	d <sub>1</sub> max	b <sub>1</sub> min	d <sub>2</sub> max	L max	Lc max	h <sub>2</sub> max	t/T	Q(ISO/DIN) min	Q <sub>0</sub>	q =				
	mm	mm	mm	mm	mm	mm	mm	mm	mm	kN	kN	kg/m			
05B-1	8.00	5.00	3.00	2.31	8.20	8.90	7.10	0.80	5.00	5.90	0.20				
*06B-1	9.53	6.35	8.72	3.28	13.15	15.15	8.26	1.34	9.00	10.30	0.41				
08B-1	12.70	8.51	5.72	4.45	16.95	19.05	11.81	1.60	18.00	19.60	0.69				
10B-1	15.88	10.16	9.65	5.08	19.50	22.0	14.73	1.70	22.40	27.50	0.93				
12B-1	19.05	12.07	11.68	5.72	22.50	25.10	16.13	1.85	29.00	33.30	1.15				
16B-1	25.40	15.88	17.02	8.28	36.10	41.50	21.08	4.09/3.10	60.00	71.00	2.71				
20B-1	31.75	19.05	19.58	10.19	42.40	47.60	26.42	4.60/3.60	95.00	101.80	3.70				
24B-1	38.10	25.4	25.40	14.63	53.40	57.10	33.40	5.80/4.80	160.00	176.00	7.10				
28B-1	44.45	27.94	30.99	15.90	65.10	69.40	37.08	7.50/6.50	200.00	215.60	8.50				
32B-1	50.80	29.21	30.99	17.81	66.00	69.50	42.29	7.00/6.00	250.00	280.30	10.25				
40B-1	63.50	39.37	38.10	22.89	82.60	91.30	52.96	8.50/7.5	355.00	392.00	16.35				
48B-1	76.20	48.26	45.72	29.24	99.10	109.60	63.88	11.70/10.00	560.00	599.20	25.00				

\* Straight side plates.

# American Standard Heavy Duty Roller Chain (H)

H Series roller chains differ from standard roller chains in the extra thickness of link plates. Thicker plates provide greater shock load resistance and increased fatigue strength.



ANSI Chain No.	Pitch	Roller diameter	Width between inter plates	Pin diameter	Pin Length		Inner plate depth	Transverse pitch	Plate thickness	Ultimate tensile strength	Average tensile strength	Weight per meter
	P	d <sub>1</sub> max	b <sub>2</sub> min	d <sub>2</sub> max	L max	L <sub>c</sub> max	h <sub>2</sub>	pt	T	Q(ISO/DIN) min	Q <sub>v</sub>	q =
	mm	mm	mm	mm	mm	mm	mm	mm	mm	kN	kN	kg/m
40H	12.70	7.95	7.85	3.96	18.20	19.70	12.00	-	2.06	14.10	20.40	0.82
50H	15.88	10.16	9.40	5.08	22.10	24.90	15.09	-	2.44	22.20	29.80	1.25
60H	19.05	11.91	12.57	5.94	29.90	34.50	18.08	-	3.26	31.80	41.00	1.87
80H	25.40	15.88	15.75	7.92	36.60	42.00	24.13	-	4.00	56.70	72.10	3.10
100H	31.75	19.05	18.90	9.53	44.10	50.20	30.18	-	4.80	88.50	106.20	4.38
120H	38.10	22.23	25.22	11.10	53.80	60.40	36.20	-	5.65	127.00	156.70	6.60
60H-2	19.05	11.91	12.57	5.94	56.00	60.60	18.08	26.11	3.26	63.60	85.00	3.71
80H-2	25.40	15.88	15.75	7.92	69.20	74.60	24.13	32.59	4.00	113.40	144.20	6.15
100H-2	31.75	19.05	18.90	9.53	83.20	89.10	30.18	39.09	4.80	177.00	212.40	8.67
120H-2	38.10	22.23	25.22	11.10	102.7	109.30	36.20	48.87	5.65	254.00	310.50	13.13
60H-3	19.05	11.91	12.57	5.94	82.10	86.70	18.08	26.11	3.26	95.40	120.00	5.54
80H-3	25.40	15.88	15.75	7.92	101.8	107.20	24.13	32.59	4.00	170.10	210.20	9.42
100H-3	31.75	19.05	18.90	9.53	122.30	128.40	30.18	39.09	4.80	265.50	316.80	12.96
120H-3	38.10	22.23	25.22	11.10	151.50	158.10	36.20	48.87	5.65	381.00	458.20	19.64

## 2. FB Chain Wear Gauge



- The FB Chain Wear Gauge is a tool that will help to identify worn, elongated and potentially dangerous chain before it breaks or fails.
- Elongation is caused by excessive wear on the chain joints whilst articulation around the roller or pulley device
- The FB Chain gauge measures wear as a percentage of pitch size providing the users with accurate readings on every service.

It shows us  
what the eye  
cannot see



## 2. Using the FB Chain Wear Gauge

- At 2% elongation the tensile strength of the chain begins reducing, making it more susceptible to failure under shock loading.
- Side plate wear into a case hardened pin, the further they wear in, the softer the pin gets.
- It is an indicator only, provided by the chain manufacturers to warn users of possible chain failure due to reduced strength
- Fulfills the repair contractor's responsibility to advise the owner of a worn, possibly dangerous component on their fork truck
- Let's make sure we know how it works...

## 2. Using the FB Chain Wear Gauge

- Check the jaws of the gauge are not damaged.
- Check gauge slides freely without obstruction..
- Close the gauge fully and check the calibration window reads OK. If the calibration window is out then it will not provide an accurate result.
- Care should be taken with the gauge which can become damaged due to heat. (eg: Van Dashboards)



## 2. Using the FB Chain Wear Gauge



- Line the red arrows of the gauge up to the pin centers of the link.
- The pitch and number of pins you should measure over appear in the top window.
- If nothing appears then turn the gauge over. The A Scale measures 3/8 to 3" inch chain and the B Scale measures 1-3/4" & 2" pitch.
- The chain Pitch and number of links to measure over will appear in the boxes at the top of the gauge.
- Now its time to measure the elongation or chain stretch.

## 2. Using the FB Chain Wear Gauge

- Place the jaws on the pin and count down the number of pins that's shown on the box below the pitch.
- This should be done in the section that runs over the roller as this part experiences the most wear.
- The chain wear will appear in the bottom window of the gauge accurate to  $\frac{1}{4}$  of a percentage of the chains pitch.



# 3. Other Chain Defects

- Elongation is not the only chain defect requiring immediate chain replacement.
- The majority of chain defects are the direct result of poor chain lubrication and maintenance
- The following is a list of chain defects that would require immediate chain replacement.
- If any of these conditions are found in chain that are inspected recommendations for immediate replacement should be given to the owner of the forklift.

# 3. Other Chain Defects

## Damage

- Do the chain plates show impact markings or other deformation?

## Surface Rust

- Surface rust can be recognised easily by the brown colouring of the outer plates and pins. Chain with surface rust will almost always have corrosion attacking the internal parts which may lead to chain seizure.
- Pits are small craters. They form in all parts of the chain if there is a shortage of, or wrong lubrication. Pits are starting points for premature fatigue fractures.



# 3. Other Chain Defects

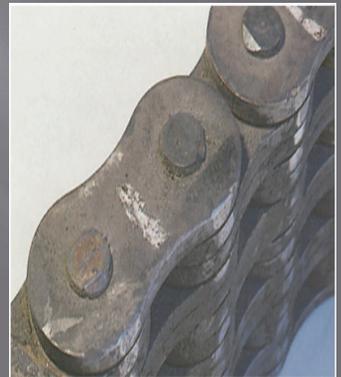
## Stiff links

- If chain links do not go back into stretched length after leaving chain deflection wheel, the chain link is no longer functionally efficient. This phenomenon can be caused by cold welding, link corrosion or briquetting.



## Twisted pins

- Twisted pins are a further indication of defective chain lubrication and are considered a phenomenon arising as a consequence of stiff links. In this case blocking of links is already so strong that the force fits between link pins and outer plates have been overcome.
- Twisted pins are easy to recognise. Their rivet flattening on the front ends deviates from the factory arrangement.



# 3. Other Chain Defects

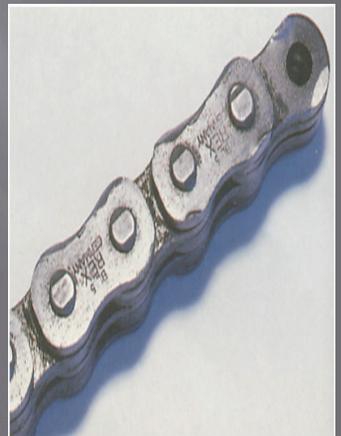
## Loose link pins

- Chains which show loosened pins in the force fit of the outer plates represent a direct danger. Pins loosened in force fit of outer plates are a direct consequence of "stiff links" and "twisted pins".



## Inadmissible external wear

- It is to be examined whether plates of the chain show outer wear, e. g. due to continuous rubbing on mast parts or in the contact area of the deflection rollers. The wear must not exceed 5 % of the original plate cross-section.



# 3. Other Chain Defects

## Broken pins

- They occur as a rule mainly as a consequence of corrosion in the chain link. This corrosion leads to pitting on the pins. It, in turn, is then the starting point for fatigue fractures (endurance failures).



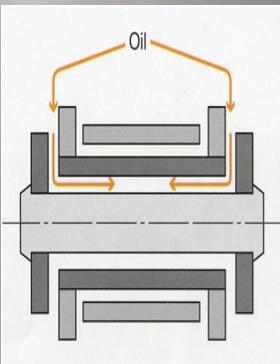
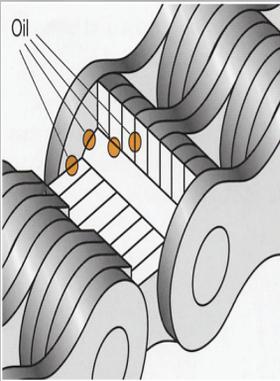
## Broken plates

- Broken chain plates are indicated by "locking" of the plate concerned in the area of the plate head or by the absence of the head part.
- Here we are dealing with fatigue fractures (= endurance failures) due to an overload.
- Corrosion can also be the initiator of such fractures.



# 3. Other Chain Defects

## Lubrication – The Basics



- Sectional drawings of chain links for roller chains and leaf chains clearly show that lubricating product must move forward a long way between narrow plate gaps in order to reach its most important goal, the chain link.
- The further task of lubricating oil is to ensure an adequate protection from corrosion. This is achieved by moistening surfaces with an adequate film thickness.
- Devices with lifting chains which are exposed outdoors to all weather conditions naturally require a slightly higher expenditure on servicing.

## Type of lubricant

- A low-viscosity mineral, machine or also motor oil and/or synthetic oil should always be used.

# 3. Other Chain Defects

## Lubrication – The Basics



### Viscosity

- Viscosity of lubricating oil is to be selected in such a way that at all ambient temperatures it remains low-viscosity. Under normal temperature conditions lubricating oils with a viscosity of SAE 20 to SAE 40 (50 to 200 mm<sup>2</sup>/s at 40° C) are OK.

### Use of spray cans

- If lubricating chains by using spray cans it must be ensured that the basic demand is met which states: After evaporation of the thinner a viscosity must be achieved which corresponds to the above mentioned recommendation.

### Lubricating methods

- The lubricating product can be applied by means of a brush, a paintbrush or with compressed air spray devices.

# 4. Practical Test

- Let's put it to use in your workshop... Once you get to know how to use the gauge you will never lose the skill. That's why if you are not sure at the start that's the time to ask someone for help.
- The identification of worn, possible dangerous chains will then become a quick and easy part of general maintenance.
- Contact your chain supplier for any further assistance needed in making the use of the FB Chain Gauge a simple. We can offer on site training on the use of the chain wear gauge in the field and identification of leaf chain type



**New**

**FB Chain Gauges now available for a faster more accurate reading on the service condition of all leaf & roller chain.**



Chain wear gauges are used by forklift and other materials handling equipment service engineers and technicians to track chain wear at each service. If a chain is shown to have worn excessively it must be replaced. The Gauge fulfils the service technician's obligation to inform the machine owner of a worn and potentially dangerous component and transfers the responsibility to take action to them. Designed to overcome the significant problems encountered when attempting to accurately measure a chain for wear, the FB Professional Chain Wear Gauge's patented design incorporates an easily read scale that enables chain elongation – the most common cause of chain failure – to be measured to within one quarter of one percent. The FB chain gauge is widely recognised as the most accurate, reliable and simple to use tool of its kind on the market and is the product recommended and used extensively throughout Europe. The inspection and measurement of chain wear in chains used for lifting applications is a standard practice in Europe and the FB chain gauge is one of the most accurate and easy to use tools available.

**Now available for Sale in Australia  
contact your distributor for details.**

# Chain Wear Gauge

The FB chain wear gauge enables you to track chain wear at each service and take any necessary action.

The FB gauge is a 'how much worn' chain gauge, showing chain wear in 1/4 percent increments from 0% to 4% worn with a red warning box appearing at 2%.

Old style chain wear gauges only tell you that a chain is either worn out or not worn out.

The FB gauge alerts you to chains that could be dangerously worn out before the next service.

The FB gauge will provide consistency across your whole service team.

It works on all pitch sizes from 3/8 to 3 inch.



Find out more by visiting  
[www.chainweargauge.com](http://www.chainweargauge.com)



Chain & Drives Australia is a stockist of high quality replacement mast and drive chains for the material handling industry. We have extensive experience in the supply of roller and leaf chain products to this industry and can offer huge savings on genuine parts by dealing direct with the chain manufacturers. We can provide on site inspection and chain identification services and work closely with your maintenance department to develop a cost effective preventative maintenance programme.

Please do not hesitate to contact us for further information or visit our web site:

[www.chainanddrives.com.au](http://www.chainanddrives.com.au)

