

International Standard



4347

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION • МЕЖДУНАРОДНАЯ ОРГАНИЗАЦИЯ ПО СТАНДАРТИЗАЦИИ • ORGANISATION INTERNATIONALE DE NORMALISATION

Leaf chains, clevises and sheaves

Chaînes de levage à mailles jointives, chapes et tourteaux de renvoi

Second edition — 1985-12-01

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work.

Draft International Standards adopted by the technical committees are circulated to the member bodies for approval before their acceptance as International Standards by the ISO Council. They are approved in accordance with ISO procedures requiring at least 75 % approval by the member bodies voting.

International Standard ISO 4347 was prepared by Technical Committee ISO/TC 100, *Chains and chain wheels for power transmission and conveyors*.

This second edition cancels and replaces the first edition (ISO 4347-1977), which has been technically revised as follows:

an increased range for LH chains (2×2 , 4×4 , 6×6 and 8×8 lacings) has been included;

sub-clause 3.4 "Minimum ultimate tensile strength" has been expanded with regard to the previous sub-clause 3.4 "Breaking loads".

Users should note that all International Standards undergo revision from time to time and that any reference made herein to any other International Standard implies its latest edition, unless otherwise stated.

Leaf chains, clevises and sheaves

0 Introduction

This International Standard has been prepared after examining the possibility of having one single series of chains derived directly from the short pitch precision chains defined in ISO 606. However, in order to be realistic, it has become clear that standardization of chains of the BL series, from American Standard ANSI B29-8, which are universally used, would also be desirable.

Consequently, this International Standard includes two series of chains, the one derived from the American Standard being designated by the symbol LH, and the one from ISO 606, suffix B, designated by the symbol LL. The dimensions are shown in inches and millimetres; the latter are conversions of the basic inch dimensions.

1 Scope and field of application

This International Standard specifies characteristics of chains used for general lifting purposes together with the rim profiles of sheaves and the chain attachment ends of clevises. It covers dimensions, limits for interchangeability, measuring loads and minimum ultimate tensile loads.

2 References

ISO 286, *ISO system for limits and fits*.¹⁾

ISO 606, *Short pitch transmission precision roller chains and chain wheels*.

3 Chains

3.1 Nomenclature

The nomenclature of chains is indicated in figure 1 and tables 1, 1M, 2 and 2M.

The illustrations in figure 1 do not necessarily define the actual form of the chain plates.

3.2 Designation

Leaf chains shall be designated by the same numerical components, taken from the standardized ISO chain number, as laid down in ISO 606 for chains with the same pitch, i.e. two digits expressing the pitch in sixteenths of an inch, preceded by the prefix LH for chains from ANSI B29-8 and LL for chains from ISO 606, suffix B, and followed by the two numbers indicating the number of plates on pin links and articulating links, respectively.

Examples:

Designation of a chain with nominal pitch of 12,7 mm derived from chain 08B, consisting of pin links and articulating links, each including two plates:

LL 0822

Designation of a chain with nominal pitch of 19,05 mm, consisting of pin links including three plates and articulating links including four plates:

LH 1234

3.3 Dimensions

Chains shall conform to the dimensions given in tables 1, 1M, 2 or 2M. Maximum and minimum dimensions are specified to ensure interchangeability of complete chains in clevises. They represent limits for interchangeability, but are not the actual tolerances that should be used in manufacture.

NOTE — Chains from different manufacturers should not be placed together within the same application.

3.4 Minimum ultimate tensile strength

3.4.1 The minimum tensile strength is the minimum strength of samples tested to destruction in tensile loading, as defined in 3.4.2. This strength is not a working load. It is intended primarily as a comparative figure between chains of various constructions. For application information, the manufacturers or their published data should be consulted.

1) At present at the stage of draft. (Revision of ISO/R 286-1962.)

3.4.2 A tensile load, not less than that specified in tables 1, 1M, 2 or 2M, is applied slowly to the ends of a chain length, containing at least five free pitches, by means of shackles permitting free movement on both sides of the chain centreline, in the normal plane of articulation.

Failure shall be considered to have occurred at the first point where increasing extension is no longer accompanied by increasing load, i.e. the summit of the load/extension diagram.

Tests in which failures occur adjacent to the shackles should be disregarded.

3.4.3 The tensile test shall be considered as a destructive test. Even though a chain may not visibly fail when subjected to the minimum ultimate tensile load, it will have been stressed beyond the yield point and will be unfit for service.

3.5 Proof loading

All chains shall be proof loaded to at least one-third of the minimum ultimate tensile load given in tables 1, 1M, 2 or 2M.

3.6 Length accuracy

As LL leaf chains are normally constructed from plates also used for short pitch transmission roller chains, the actual pitch

of the chain does not necessarily equal its nominal pitch but depends upon each manufacturer. For the specific chain length, consult the manufacturer.

Finished chains shall be measured after proof loading, but before lubricating.

The standard length of chain for measurement shall be 49 pitches or 1 524 mm, whichever is less, and shall terminate with an identical link at each end.

The chain shall be supported throughout its entire length and a measuring load equal to 1/100 of the ultimate tensile load given in tables 1, 1M, 2 or 2M shall be applied.

The length tolerance of $\pm 0,25\%$ shall be applied to the specific length of the chain.

3.7 Cranked links

Cranked links shall not be used in leaf chains.

3.8 Marking

The chains should be marked with the manufacturer's name or trade mark.

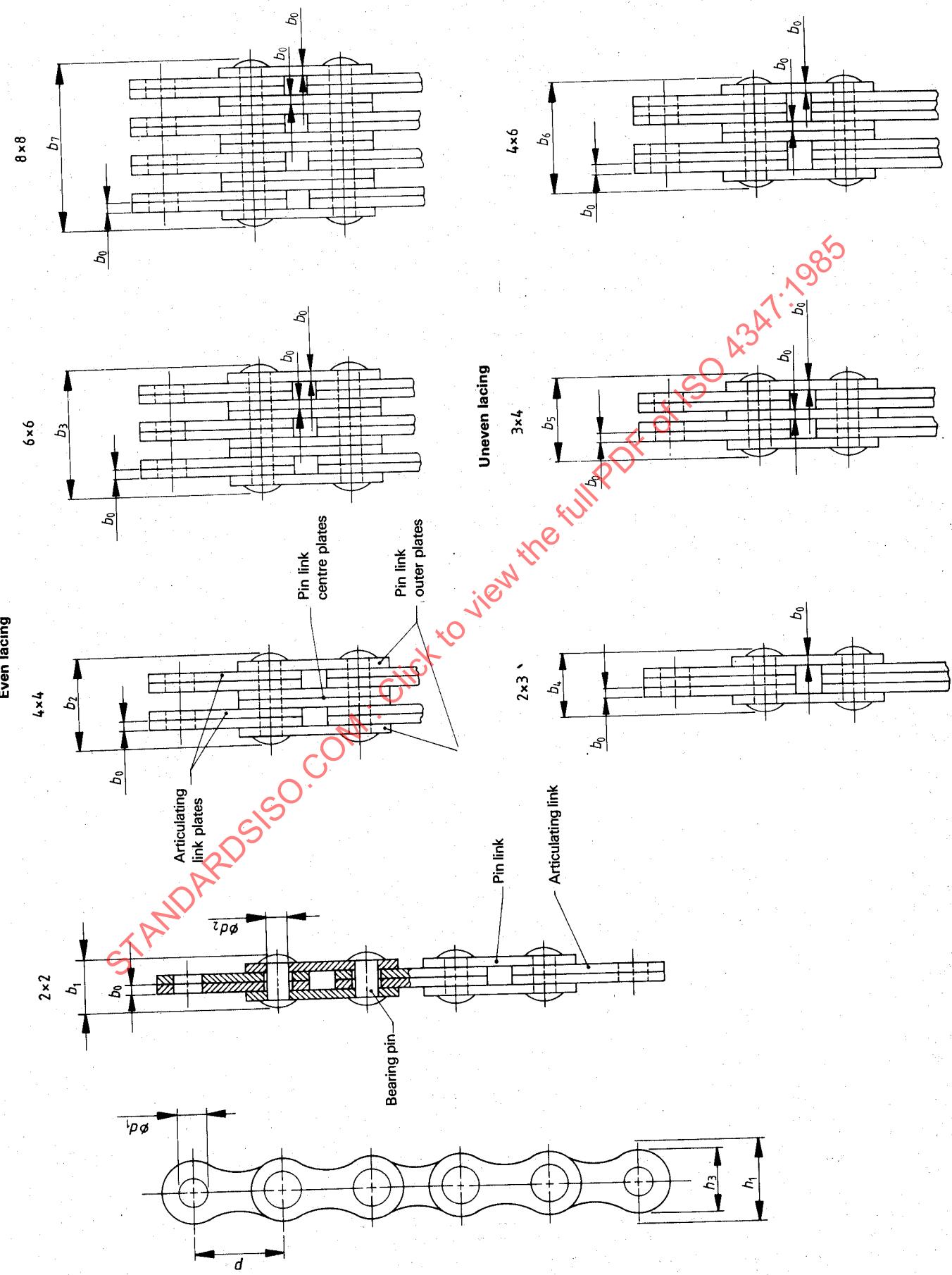


Figure 1 – Symbols related to tables 1, 1M, 2 and 2M

Table 2 — Chain dimensions and ultimate tensile loads, LL series (Inch/pound units)

ISO chain number	Pitch p nom. in	Lacing	Thickness of plates b_0	Hole diameter of articulating link plates d_1 min.	Bearing pin diameter d_2	Chain path depth ¹⁾ h_1	Plate depth h_3	Width over riveted bearing pins b_1, b_2, b_3	Ultimate tensile load
			max.	in	in	in	in	max.	min.
								in	lbf
LL 0822	0.500	2 × 2						0.300	4 000
LL 0844		4 × 4	0.051	0.175 5	0.175 0	0.440	0.430	0.510	7 000
LL 0866		6 × 6						0.725	10 000
LL 1022	0.625	2 × 2						0.365	5 000
LL 1044		4 × 4	0.065	0.200 5	0.200 0	0.550	0.540	0.635	10 000
LL 1066		6 × 6						0.900	15 000
LL 1222	0.750	2 × 2						0.420	6 500
LL 1244		4 × 4	0.075	0.225 5	0.225 0	0.645	0.635	0.730	13 000
LL 1266		6 × 6						1.035	19 500
LL 1622	1.000	2 × 2						0.675	9 500
LL 1644		4 × 4	0.126	0.327 0	0.326 0	0.840	0.830	1.190	19 000
LL 1666		6 × 6						1.700	28 500
LL 2022	1.250	2 × 2						0.790	14 500
LL 2044		4 × 4	0.146	0.402 0	0.401 0	1.050	1.040	1.380	29 000
LL 2066		6 × 6						1.970	43 500
LL 2422	1.500	2 × 2						1.120	22 000
LL 2444		4 × 4	0.205	0.577 0	0.576 0	1.328	1.315	1.945	44 000
LL 2466		6 × 6						2.770	66 000
LL 2822	1.750	2 × 2						1.340	29 000
LL 2844		4 × 4	0.254	0.627 0	0.626 0	1.475	1.460	2.360	58 000
LL 2866		6 × 6						3.385	87 000
LL 3222	2.000	2 × 2						1.380	38 000
LL 3244		4 × 4	0.254	0.702 0	0.701 0	1.682	1.665	2.400	76 000
LL 3266		6 × 6						3.425	114 000
LL 4022	2.500	2 × 2						1.760	59 000
LL 4044		4 × 4	0.325	0.902 0	0.901 0	2.106	2.085	3.065	118 000
LL 4066		6 × 6						4.374	177 000
LL 4822	3.000	2 × 2	0.406	1.152 0	1.151 0	2.540	2.515	2.210	90 000
LL 4844		4 × 4						3.835	180 000
LL 4866		6 × 6						5.470	270 000

1) Chain path depth = minimum depth of channel through which the assembled chain will pass.

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Table 2M — Chain dimensions and ultimate tensile loads, LL series (Metric units)

ISO chain number	Pitch <i>p</i> nom. mm	Lacing	Thickness of plates <i>b</i> ₀	Hole diameter of articulating link plates <i>d</i> ₁	Bearing pin diameter <i>d</i> ₂	Chain path depth ¹⁾ <i>h</i> ₁	Plate depth <i>h</i> ₃	Width over riveted bearing pins <i>b</i> ₁ , <i>b</i> ₂ , <i>b</i> ₃	Ultimate tensile load daN
			max.	min.	max.	min.	max.	max.	min.
			mm	mm	mm	mm	mm	mm	daN
LL 0822		2 × 2						7,60	1 780
LL 0844	12,700	4 × 4	1,30	4,46	4,45	11,18	10,92	13,00	3 110
LL 0866		6 × 6						18,40	4 450
LL 1022		2 × 2						9,30	2 220
LL 1044	15,875	4 × 4	1,65	5,09	5,08	13,98	13,72	16,10	4 450
LL 1066		6 × 6						22,90	6 670
LL 1222		2 × 2						10,70	2 890
LL 1244	19,050	4 × 4	1,90	5,73	5,72	16,39	16,13	18,50	5 780
LL 1266		6 × 6						26,30	8 670
LL 1622		2 × 2						17,20	4 230
LL 1644	25,400	4 × 4	3,20	8,30	8,28	21,34	21,08	30,20	8 450
LL 1666		6 × 6						43,20	12 680
LL 2022		2 × 2						20,10	6 450
LL 2044	31,750	4 × 4	3,70	10,21	10,19	26,68	26,42	35,10	12 900
LL 2066		6 × 6						50,10	19 350
LL 2422		2 × 2						28,40	9 790
LL 2444	38,100	4 × 4	5,20	14,65	14,63	33,73	33,40	49,40	19 570
LL 2466		6 × 6						70,40	29 360
LL 2822		2 × 2						34,00	12 900
LL 2844	44,450	4 × 4	6,45	15,92	15,90	37,46	37,08	60,00	25 800
LL 2866		6 × 6						86,00	38 700
LL 3222		2 × 2						35,00	16 900
LL 3244	50,800	4 × 4	6,45	17,83	17,81	42,72	42,29	61,00	33 810
LL 3266		6 × 6						87,00	50 720
LL 4022		2 × 2						44,70	26 240
LL 4044	63,500	4 × 4	8,25	22,91	22,89	53,49	52,96	77,90	52 490
LL 4066		6 × 6						111,10	78 730
LL 4822		2 × 2						56,10	40 030
LL 4844	76,200	4 × 4	10,30	29,26	29,24	64,52	63,88	97,40	80 070
LL 4866		6 × 6						138,90	120 100

1) Chain path depth = minimum depth of channel through which the assembled chain will pass.

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4 Clevises

4.1 Dimensions

The dimensions of terminal clevises for use with LH series and LL series leaf chains shall be as given in tables 3, 3M, 4 or 4M. Limiting dimensions laid down in these tables are for the purpose of ensuring acceptance of chains built in accordance with the previously published standards.

4.2 Ultimate tensile strength

The clevises and the pins used to anchor chains shall be of adequate strength to withstand at least the ultimate tensile load of the chain.

4.3 Length adjustment

In multi-strand applications, where it becomes necessary within the chain assembly to compensate for small length differences between strands, it is always desirable to provide within the anchoring device a length adjustment at least equal to one pitch of the chain.

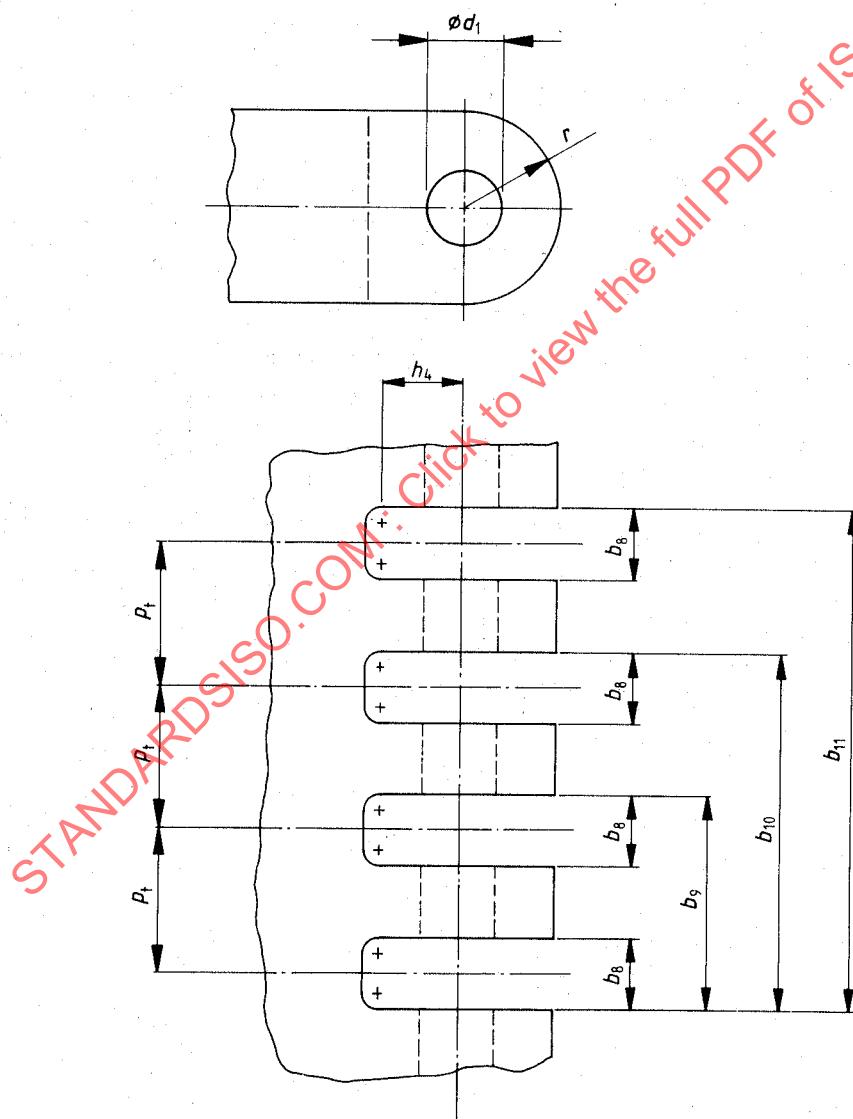


Figure 2 — Dimensions of terminal clevises

Table 3 — Clevis dimensions, LH series (Inch units)

Dimensions in inches

ISO chain number	b_8 H11 ¹⁾	b_9 H11 ¹⁾	b_{10} H11 ¹⁾	b_{11} H11 ¹⁾	p_t nom.	d_1 min.	h_4 min.	r max.
LH 0822	0.171	—	—	—	—			
LH 0823	0.258	—	—	—	—			
LH 0834	0.171	0.421	—	—	0.250			
LH 0844	0.171	0.508	—	—	0.334			
LH 0846	0.258	0.676	—	—	0.418			
LH 0866	0.171	0.508	0.842	—	0.334			
LH 0888	0.171	0.508	0.842	1.176	0.334			
LH 1022	0.203	—	—	—	—			
LH 1023	0.301	—	—	—	—			
LH 1034	0.199	0.492	—	—	0.293			
LH 1044	0.203	0.593	—	—	0.390			
LH 1046	0.301	0.789	—	—	0.488			
LH 1066	0.203	0.593	0.983	—	0.390			
LH 1088	0.203	0.593	0.983	1.373	0.390			
LH 1222	0.274	—	—	—	—			
LH 1223	0.406	—	—	—	—			
LH 1234	0.269	0.665	—	—	0.396			
LH 1244	0.274	0.802	—	—	0.528			
LH 1246	0.406	1.066	—	—	0.660			
LH 1266	0.274	0.802	1.330	—	0.528			
LH 1288	0.274	0.802	1.330	1.858	0.528			
LH 1622	0.338	—	—	—	—			
LH 1623	0.501	—	—	—	—			
LH 1634	0.332	0.821	—	—	0.489			
LH 1644	0.338	0.990	—	—	0.652			
LH 1646	0.501	1.316	—	—	0.815			
LH 1666	0.338	0.990	1.642	—	0.652			
LH 1688	0.338	0.990	1.642	2.294	0.652			
LH 2022	0.404	—	—	—	—			
LH 2023	0.599	—	—	—	—			
LH 2034	0.397	0.982	—	—	0.585			
LH 2044	0.404	1.184	—	—	0.780			
LH 2046	0.599	1.574	—	—	0.975			
LH 2066	0.404	1.184	1.964	—	0.780			
LH 2088	0.404	1.184	1.964	2.744	0.780			
LH 2422	0.474	—	—	—	—			
LH 2423	0.703	—	—	—	—			
LH 2434	0.466	1.153	—	—	0.687			
LH 2444	0.474	1.390	—	—	0.916			
LH 2446	0.703	1.848	—	—	1.145			
LH 2466	0.474	1.390	2.306	—	0.916			
LH 2488	0.474	1.390	2.306	3.222	0.916			
LH 2822	0.538	—	—	—	—			
LH 2823	0.798	—	—	—	—			
LH 2834	0.529	1.309	—	—	0.780			
LH 2844	0.538	1.578	—	—	1.040			
LH 2846	0.798	2.098	—	—	1.300			
LH 2866	0.538	1.578	2.618	—	1.040			
LH 2888	0.538	1.578	2.618	3.658	1.040			
LH 3222	0.616	—	—	—	—			
LH 3223	0.914	—	—	—	—			
LH 3234	0.606	1.500	—	—	0.894			
LH 3244	0.616	1.808	—	—	1.192			
LH 3246	0.914	2.404	—	—	1.490			
LH 3266	0.616	1.808	3.000	—	1.192			
LH 3288	0.616	1.808	3.000	4.192	1.192			
LH 4022	0.808	—	—	—	—			
LH 4023	1.200	—	—	—	—			
LH 4034	0.796	1.972	—	—	1.176			
LH 4044	0.808	2.376	—	—	1.568			
LH 4046	1.200	3.160	—	—	1.960			
LH 4066	0.808	2.376	3.944	—	1.568			
LH 4088	0.808	2.376	3.944	5.512	1.568			

1) Tolerance H11 in accordance with ISO 286.

Table 3M — Clevis dimensions, LH series (Metric units)

Dimensions in millimetres

ISO chain number	b_8 H11 ¹⁾	b_9 H11 ¹⁾	b_{10} H11 ¹⁾	b_{11} H11 ¹⁾	p_t nom.	d_1 min.	h_4 min.	r
LH 0822	4,34	—	—	—	—			
LH 0823	6,55	—	—	—	—			
LH 0834	4,34	10,69	—	—	6,35			
LH 0844	4,34	12,90	—	—	8,48			
LH 0846	6,55	17,17	—	—	10,62			
LH 0866	4,34	12,90	21,39	—	8,48			
LH 0888	4,34	12,90	21,39	29,87	8,48			
LH 1022	5,16	—	—	—	—			
LH 1023	7,65	—	—	—	—			
LH 1034	5,05	12,50	—	—	7,44			
LH 1044	5,16	15,06	—	—	9,91			
LH 1046	7,65	20,04	—	—	12,40			
LH 1066	5,16	15,06	24,97	—	9,91			
LH 1088	5,16	15,06	29,97	34,87	9,91			
LH 1222	6,96	—	—	—	—			
LH 1223	10,31	—	—	—	—			
LH 1234	6,83	16,89	—	—	10,06			
LH 1244	6,96	20,37	—	—	13,41			
LH 1246	10,31	27,08	—	—	16,76			
LH 1266	6,96	20,37	33,78	—	13,41			
LH 1288	6,96	20,37	33,78	47,19	13,41			
LH 1622	8,59	—	—	—	—			
LH 1623	12,73	—	—	—	—			
LH 1634	8,43	20,85	—	—	12,42			
LH 1644	8,59	25,15	—	—	16,56			
LH 1646	12,73	33,43	—	—	20,70			
LH 1666	8,59	25,15	41,71	—	16,56			
LH 1688	8,59	25,15	41,71	58,27	16,56			
LH 2022	10,26	—	—	—	—			
LH 2023	15,21	—	—	—	—			
LH 2034	10,08	24,94	—	—	14,86			
LH 2044	10,26	30,07	—	—	19,81			
LH 2046	15,21	39,98	—	—	24,77			
LH 2066	10,26	30,07	49,89	—	19,81			
LH 2088	10,26	30,07	49,89	69,70	19,81			
LH 2422	12,04	—	—	—	—			
LH 2423	17,86	—	—	—	—			
LH 2434	11,84	29,29	—	—	17,45			
LH 2444	12,04	35,31	—	—	23,27			
LH 2446	17,86	46,94	—	—	29,08			
LH 2466	12,04	35,31	58,58	—	23,27			
LH 2488	12,04	35,31	58,58	81,85	23,27			
LH 2822	13,67	—	—	—	—			
LH 2823	20,27	—	—	—	—			
LH 2834	13,44	33,25	—	—	19,81			
LH 2844	13,67	40,08	—	—	26,42			
LH 2846	20,27	53,29	—	—	33,09			
LH 2866	13,67	40,08	66,50	—	26,42			
LH 2888	13,67	40,08	66,50	92,91	26,42			
LH 3222	15,65	—	—	—	—			
LH 3223	23,22	—	—	—	—			
LH 3234	15,39	38,10	—	—	22,71			
LH 3244	15,65	45,92	—	—	30,28			
LH 3246	23,22	61,06	—	—	37,85			
LH 3266	15,65	45,92	76,20	—	30,28			
LH 3288	15,65	45,92	76,20	106,48	30,28			
LH 4022	20,52	—	—	—	—			
LH 4023	30,48	—	—	—	—			
LH 4034	20,22	50,09	—	—	29,87			
LH 4044	20,52	60,35	—	—	39,83			
LH 4046	30,48	80,26	—	—	49,78			
LH 4066	20,52	60,35	100,18	—	39,83			
LH 4088	20,52	60,35	100,18	140,01	39,83			

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1) Tolerance H11 in accordance with ISO 286.