AN AMERICAN NATIONAL STANDARD

Flexible Chain Couplings

ANSI/ASME B29.23M-1985

REAFFIRMED 1995

FOR CURRENT COMMITTEE PERSONNEL
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THE AMERICAN SOCIETY OF MECHANICAL ENGINEERS

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Date of Issuance: June 15, 1985

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FOREWORD

(This Foreword is not part of ANSI/ASME B29.23M-1985.)

This Standard is intended to fulfill the need for control of dimensional specifications for flexible chain couplings with covers that utilize a roller chain or silent chain as the coupling medium. Metric equivalents of all dimensions and capacities are given.

This Standard was first submitted by the Chain Coupling Committee of the Roller Chain Technical Committee of the American Chain Association and utilizes information supplied by the members as well as the AGMA Standard Nos. 510.02, 511.02, 512.03, 513.01, and 515.01 pertaining to flexible couplings. Approval of this Standard was granted by the ASME Standards Committee B29 and the ASME.

The American National Standards Institute, Inc., approved this Standard on April 10, 1985.

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AN AMERICAN NATIONAL STANDARD

FLEXIBLE CHAIN COUPLINGS

1 DESCRIPTION AND DEFINITIONS

1.1 Description

A chain type flexible coupling is one member of a broad family of mechanical shaft connectors that transmit torque without slip and that will accommodate a moderate misalignment between axially oriented driving and driven machine members.

This Standard covers couplings of the chain type where two hubs having chain sprocket teeth are engaged by means of a length of roller chain or silent chain.

1.2 Definitions

sprocket hub – that part of the coupling which is machined for mounting on a machine shaft. Sprocket teeth are cut on the periphery of the hub flange to positively engage the chain.

chain (see Fig. 1)

(*a*) an ANSI B29.1 type double strand chain, or

(*b*) a special single strand roller chain specially designed for coupling applications only, or

(*c*) a silent chain

Only the double strand ANSI B29.1 type chains can be interchanged. The single strand roller chains and silent chains are not, generally, interchangeable. Chain size is normally stated in terms of chain pitch, which is the average distance between the joint centers of an assembled chain.

cover – a part of the coupling which encloses the chain to retain lubricant, to protect the working parts, and to protect workers from the rotating chains

2 GENERAL DIMENSIONS

2.1 Overall Coupling Dimensions

See Fig. 2 for a depiction of the nomenclature listed below.

A = maximum length over both sprocket hubs, including clearance between sprocket faces
B = maximum diameter of chain coupling cover
C = nominal diameter of clearance path around chain
D = maximum diameter of sprocket hubs
E = maximum sprocket hub depth where both sprockets do not have the same hub depth

2.2 Bore and Keyway Dimensions

2.2.1 Standard Finished Bore. A finished machined bore and keyway in the hub shall have dimensions and tolerances in accordance with the latest issue of AGMA Standard, Bore and Keyway Standard for Flexible Couplings.

2.2.2 Taper Bore Hubs. A finished machined tapered bore and keyway in the hub shall have dimensions and tolerances in accordance with the latest issue of AGMA Standard, Bore and Keyway Standard for Flexible Couplings.

2.2.3 Keyways. Keyways in hubs shall have dimensions and tolerances in accordance with the latest issue of AGMA Standard, Bore and Keyway Standard for Flexible Couplings.

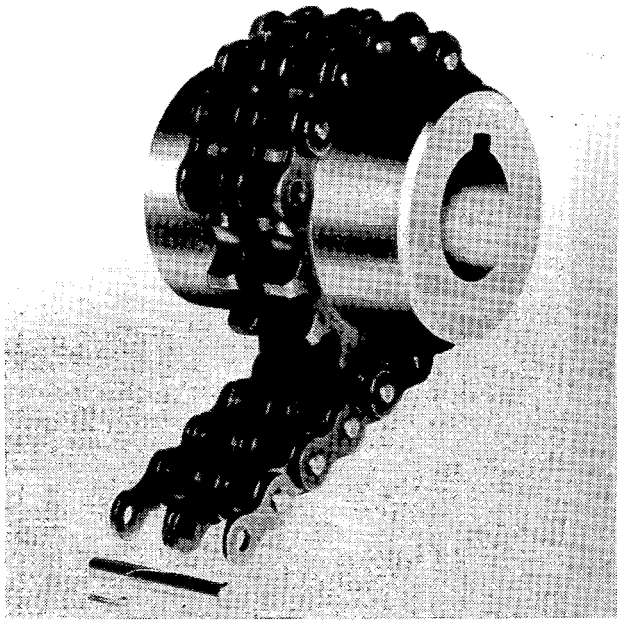
3 MISALIGNMENT CAPABILITIES

Coupling should be aligned as perfectly as possible because any amount of misalignment will decrease the life of the coupling. Misalignment values listed below are for guidance only.

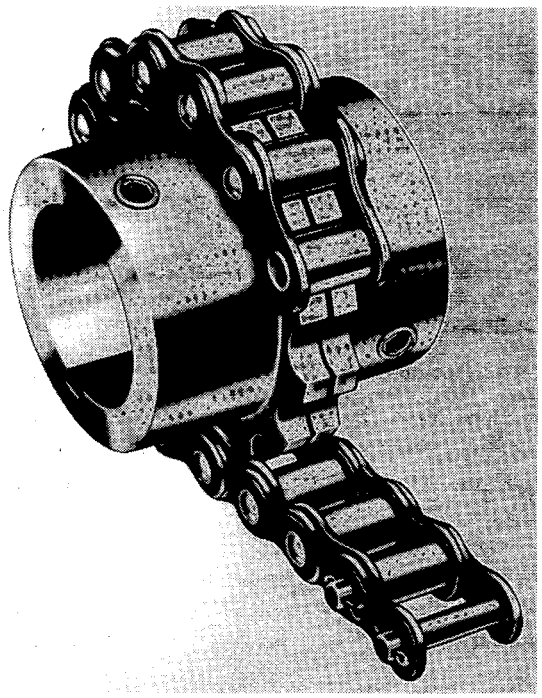
3.1 Parallel Offset

When two shafts are not coaxial but their axes are parallel, the misalignment is as shown in Fig. 3. This value for Y is not to exceed 2% of chain pitch.

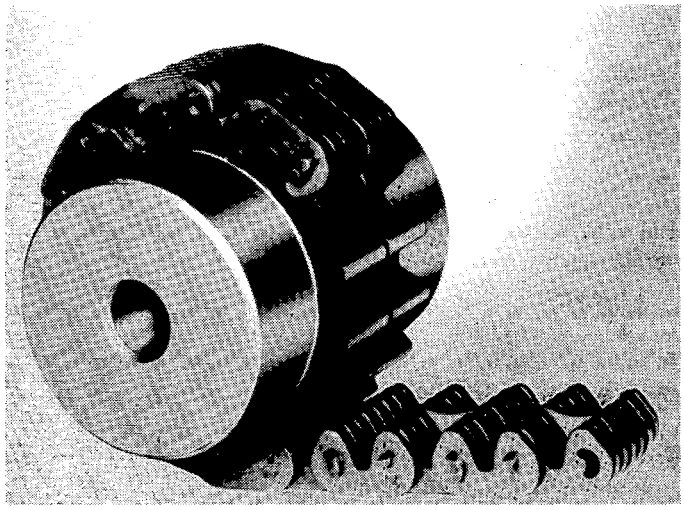
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(a) Double Strand Roller Chain Coupling



(b) Single Strand Roller Chain Coupling

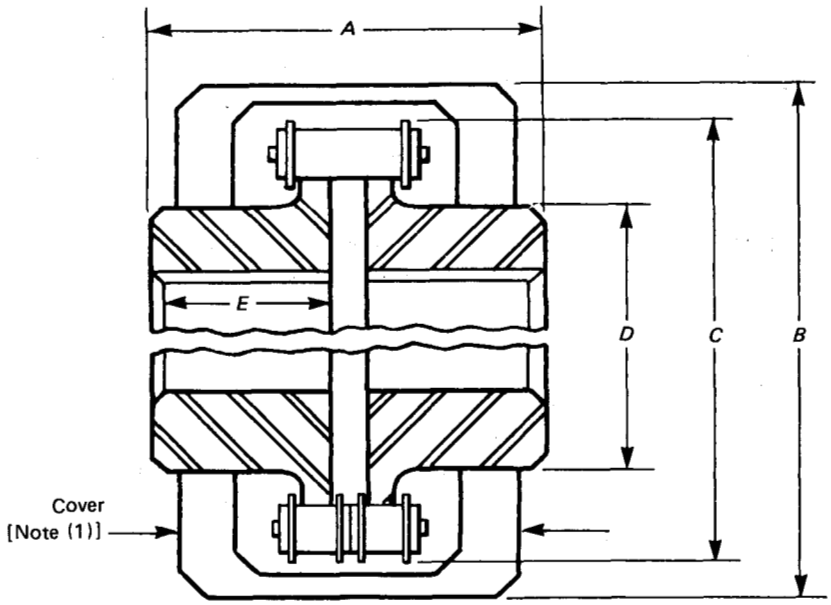


(c) Silent Chain Coupling

FIG. 1 CHAIN COUPLINGS

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A = maximum length over both sprocket hubs, including clearance between sprocket faces
B = maximum diameter of chain coupling cover
C = nominal diameter of clearance path around chain
D = maximum diameter of sprocket hubs
E = maximum sprocket hub depth where both sprockets do not have the same hub depth

NOTE:
(1) Overall length of the cover shall not exceed dimension *A*.

FIG. 2 OVERALL COUPLING DIMENSIONS

3.2 Angular Misalignment

When two shafts are not coaxial and their axes are not parallel, the misalignment is as shown in Fig. 4. For maximum life, angular misalignment should not exceed ½ deg.

3.3 Combined Offset-Angular Misalignment

When the axes of the two shafts are not parallel and not intersecting, the misalignment is as shown in Fig. 5. The combined misalignment must be substantially less than the above-noted values for maximum life.

4 COVERS

4.1 Definition

A cover is a part of the coupling which encloses the chain to retain lubricant, to protect the working parts (chain and sprocket teeth) from the environment, and to protect workers from rotating chains. Use of the cover is optional, provided the operating speed does not exceed the maximum limit recommended by the manufacturer and safety codes are met. Covers may be constructed of any material with sufficient strength to withstand centrifugal force. They are typically made from either plastic, aluminum, or sheet metal. Covers can be split either axially or radially. The cover shall have a feature to retain the lubricant.

4.2 Dimensions

Cover dimensions are to be no larger than those listed in Tables 1 through 3.

4.3 Warning

Couplings and covers are potentially hazardous and should be installed and maintained with guarding conforming to all provisions of the latest issue of ANSI/ASME B15.1, Safety Standard for Mechanical Power Transmission Apparatus. In addition, it should be recognized that rotating couplings, if improperly applied, installed, or maintained, have the capability to throw off parts.

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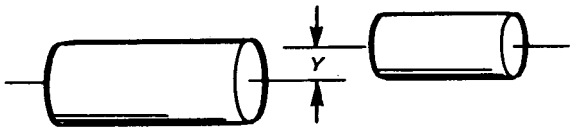


FIG. 3 PARALLEL OFFSET MISALIGNMENT

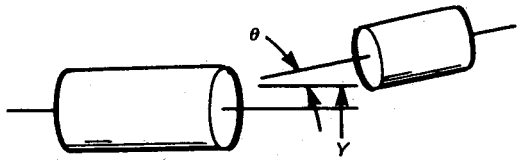
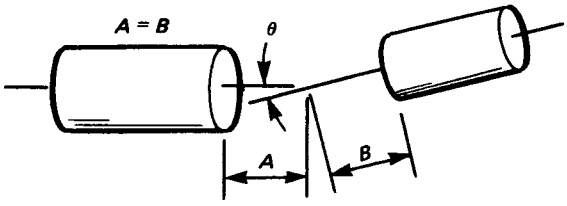
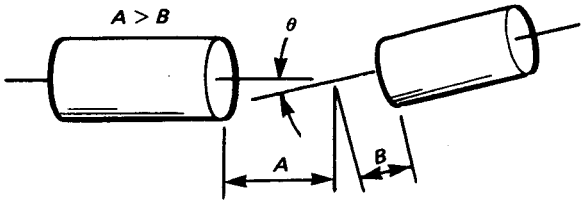


FIG. 5 COMBINED OFFSET-ANGULAR MISALIGNMENT



Symmetrical Angular Misalignment



Nonsymmetrical Angular Misalignment

FIG. 4 ANGULAR MISALIGNMENT

Therefore, guarding should have the ability to contain parts thrown off as well as keep people from contact with the rotating parts. It is the responsibility of the user to ensure that the guarding provided meets applicable safety codes.

5 LUBRICATION

5.1 Without Covers

Couplings without covers should be lubricated with a heavy grease such as an open gear grease which resists slinging due to centrifugal force.

5.2 With Covers

Couplings operating with covers shall be lubricated with a grease lubricant to NLGI No. 1 specifications.

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TABLE 1A
GENERAL COUPLING DIMENSIONS, in.
DOUBLE ROLLER CHAIN TYPE

Coupling Size, Pitch – No. of Teeth	Pitch	Length, Overall, *A* Max.	Cover O.D., *B* Max.	Chain Clearance Diam., *C* Nom.	Hub O.D., *D* Max.
3/8 – 18	0.375	2.188	3.312	2.531	1.750
1/2 – 12	0.500	2.688	4.000	2.406	1.406
1/2 – 16	0.500	2.688	4.000	3.031	2.062
1/2 – 18	0.500	2.688	4.062	3.344	2.375
1/2 – 20	0.500	2.938	4.625	3.625	2.500
5/8 – 10	0.625	...	...	...	...
5/8 – 12	0.625	...	...	...	...
5/8 – 16	0.625	3.312	5.125	3.781	2.547
5/8 – 18	0.625	4.188	5.625	4.188	3.000
3/4 – 16	0.750	3.625	6.000	4.500	3.000
3/4 – 18	0.750	4.218	6.375	5.000	3.531
3/4 – 20	0.750	4.562	7.312	5.500	4.017
3/4 – 22	0.750	5.250	7.250	5.938	4.500
1 – 14	1.000	5.250	6.000	5.375	3.438
1 – 16	1.000	...	...	...	...
1 – 18	1.000	5.750	8.188	6.688	4.625
1 – 20	1.000	5.875	8.375	7.375	5.375
1 – 22	1.000	5.250	8.625	7.906	5.188
1 1/4 – 16	1.250	...	...	...	...
1 1/4 – 18	1.250	6.250	10.125	8.406	5.750
1 1/4 – 20	1.250	7.625	10.875	9.141	6.718
1 1/2 – 16	1.500	7.375	9.406	9.093	6.125
1 1/2 – 18	1.500	7.875	11.375	10.031	6.750
1 1/2 – 20	1.500	8.750	12.250	10.938	7.750
1 1/2 – 22	1.500	8.875	13.250	11.906	8.750
1 3/4 – 16	1.750	...	...	...	...
1 3/4 – 18	1.750	8.375	13.250	11.703	7.500
2 – 16	2.000	8.375	13.250	12.125	7.500

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TABLE 1B
GENERAL COUPLING DIMENSIONS, mm
DOUBLE ROLLER CHAIN TYPE

Coupling Size, Pitch – No. of Teeth	Pitch	Length, Overall, *A* Max.	Cover O.D., *B* Max.	Chain Clearance Diam., *C* Nom.	Hub O.D., *D* Max.
3/8 – 18	9.53	55.58	84.12	64.29	44.45
1/2 – 12	12.70	68.28	101.60	61.11	35.71
1/2 – 16	12.70	68.28	101.60	76.99	52.37
1/2 – 18	12.70	68.28	103.17	84.94	60.33
1/2 – 20	12.70	74.63	117.48	92.08	63.50
5/8 – 10	15.88	...	...	...	...
5/8 – 12	15.88	...	...	...	...
5/8 – 16	15.88	84.12	130.18	96.04	64.69
5/8 – 18	15.88	106.38	142.88	106.38	76.20
3/4 – 16	19.05	92.08	152.40	114.30	76.20
3/4 – 18	19.05	107.14	161.93	127.00	89.69
3/4 – 20	19.05	115.87	185.72	139.70	102.03
3/4 – 22	19.05	133.35	184.15	150.83	114.30
1 – 14	25.40	133.35	152.40	136.53	87.33
1 – 16	25.40	...	...	...	...
1 – 18	25.40	146.05	207.98	169.88	117.48
1 – 20	25.40	149.23	212.73	187.33	136.53
1 – 22	25.40	133.35	219.08	200.81	131.78
1 1/4 – 16	31.75	...	...	...	...
1 1/4 – 18	31.75	158.75	257.18	213.51	146.05
1 1/4 – 20	31.75	193.68	276.23	232.18	170.64
1 1/2 – 16	38.10	187.33	238.91	230.96	155.58
1 1/2 – 18	38.10	200.03	288.93	254.79	171.45
1 1/2 – 20	38.10	222.25	311.15	277.83	196.85
1 1/2 – 22	38.10	225.43	336.55	302.41	222.25
1 3/4 – 16	44.45	...	...	...	...
1 3/4 – 18	44.45	212.73	336.55	297.26	190.50
2 – 16	50.80	212.73	336.55	307.98	190.50
2 – 18	50.80	...	...	...	...
2 – 20	50.80	...	...	...	...

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TABLE 2A
GENERAL COUPLING DIMENSIONS, in.
SINGLE ROLLER CHAIN TYPE

Coupling Size, Pitch – No. of Teeth	Pitch	Length, Overall, *A* Max.	Cover O.D., *B* Max.	Chain Clearance Diam., *C* Nom.	Hub O.D., *D* Max.
1/2 – 12	0.500	2.250	3.00	2.406	1.375
5/8 – 10	0.625	2.438	4.125	2.594	1.312
5/8 – 12	0.625	2.688	4.500	3.000	1.750
5/8 – 16	0.625	2.938	5.375	3.812	2.531
5/8 – 18	0.625	3.062	5.750	4.156	2.938
3/4 – 18	0.750	4.062	6.406	5.062	3.500
3/4 – 22	0.750	4.312	7.375	6.000	4.500
1 – 16	1.000	5.188	7.625	6.093	3.875
1 – 18	1.000	5.562	8.250	6.719	4.750
1 1/4 – 16	1.250	5.562	9.062	7.531	5.062
1 1/4 – 18	1.250	6.281	10.250	8.375	5.500
1 1/4 – 20	1.250	6.281	11.500	9.188	6.250
1 1/2 – 16	1.500	6.813	10.562	9.125	6.250
1 1/2 – 18	1.500	6.813	12.250	10.062	6.875
1 3/4 – 16	1.750	7.375	12.031	10.562	7.219
1 3/4 – 18	1.750	7.625	14.000	11.750	7.375
2 – 10	2.000	5.875	9.781	8.250	4.750
2 – 16	2.000	8.375	13.531	12.062	8.375
2 – 18	2.000	7.906	16.000	13.438	9.375

TABLE 2B
GENERAL COUPLING DIMENSIONS, mm
SINGLE ROLLER CHAIN TYPE

Coupling Size, Pitch – No. of Teeth	Pitch	Length, Overall, *A* Max.	Cover O.D., *B* Max.	Chain Clearance Diam., *C* Nom.	Hub O.D., *D* Max.
1/2 – 12	12.7	57.15	76.20	61.11	34.93
5/8 – 10	15.88	61.93	104.78	65.89	33.32
5/8 – 12	15.88	68.28	114.30	76.20	44.45
5/8 – 16	15.88	74.63	136.53	96.82	64.29
5/8 – 18	15.88	77.77	146.05	105.56	74.63
3/4 – 18	19.05	103.17	162.17	128.57	88.90
3/4 – 22	19.05	109.52	187.33	152.40	114.30
1 – 16	25.40	131.78	193.68	154.76	98.43
1 – 18	25.40	141.27	209.55	170.66	120.65
1 1/4 – 16	31.75	141.27	230.17	191.29	128.57
1 1/4 – 18	31.75	159.54	260.35	212.73	139.70
1 1/4 – 20	31.75	159.54	292.10	233.38	158.75
1 1/2 – 16	38.10	173.05	268.27	231.78	158.75
1 1/2 – 18	38.10	173.05	311.15	255.57	174.63
1 3/4 – 16	44.45	187.33	305.59	268.27	183.36
1 3/4 – 18	44.45	193.68	355.60	298.45	187.83
2 – 10	50.80	149.23	248.44	209.55	120.65
2 – 16	50.80	212.73	343.69	306.37	212.73
2 – 18	50.80	200.81	406.40	341.33	283.13

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TABLE 3A
GENERAL COUPLING DIMENSIONS, in.
SILENT CHAIN TYPE

Coupling Size, Pitch – No. of Teeth	Pitch	Length Overall, *A* Max.	Cover O.D. *B* Max.	Chain Clearance Diam., *C* Nom.	Hub O.D., *D* Max.	*E* Max.
3/8 – 16	0.375	2.688	3.188	2.250	1.438	...
1/2 – 16	0.500	4.562	4.062	3.062	1.875	2.375
1/2 – 20	0.500	4.562	4.625	3.688	2.500	2.375
1/2 – 24	0.500	4.562	5.250	4.375	3.125	2.375
5/8 – 20	0.625	3.750	5.750	4.625	3.125	...
3/4 – 20	0.750	6.500	6.625	5.562	3.750	3.375
3/4 – 24	0.750	6.500	7.625	6.562	4.750	3.375
1 – 20	1.000	8.125	8.500	7.438	5.000	...
1 – 24	1.000	8.125	9.750	8.688	6.250	...
1 1/2 – 16	1.500	8.125	10.250	9.125	5.625	...
1 1/2 – 20	1.500	12.188	12.250	11.188	7.500	...
1 1/2 – 24	1.500	12.188	14.125	13.062	9.375	...

TABLE 3B
GENERAL COUPLING DIMENSIONS, mm
SILENT CHAIN TYPE

Coupling Size, Pitch – No. of Teeth	Pitch	Length Overall, *A* Max.	Cover O.D. *B* Max.	Chain Clearance Diam., *C* Nom.	Hub O.D., *D* Max.	*E* Max.
3/8 – 16	9.53	68.28	80.98	57.15	36.53	...
1/2 – 16	12.70	115.88	103.18	77.78	47.63	60.33
1/2 – 20	12.70	115.88	115.88	93.68	63.50	60.33
1/2 – 24	12.70	115.88	130.18	111.13	79.38	60.33
5/8 – 20	15.88	95.25	146.05	117.48	79.38	...
3/4 – 20	19.05	165.10	168.28	141.28	95.25	85.73
3/4 – 24	19.05	165.10	193.68	166.68	120.65	85.73
1 – 20	25.40	206.38	215.90	188.93	127.00	...
1 – 24	25.40	206.38	247.65	220.68	158.75	...
1 1/2 – 16	38.10	206.38	260.35	231.78	142.88	...
1 1/2 – 20	38.10	309.58	311.15	284.18	190.50	...
1 1/2 – 24	38.10	309.58	358.78	331.78	238.13	...

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