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API SPEC 6A, 16A, 17D AND MSS FLANGE GASKET, BOLT AND TORQUE REFERENCE CHART

TRADEMARK



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FOR FURTHER INFORMATION, OR TO LEARN MORE ABOUT WOODCO USA PRODUCTS AND SERVICES,

CONTACT:

WOODCO USA
P.O. Box 1261
Houston, Texas 77251-1261
Phone: 713-672-9491
U.S. and Canada: 1-800-496-6326
Fax: 713-672-8768
www.woodcousa.com
sales@woodcousa.com

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Flange Reference Chart

Torque values shown on this page apply only to API Spec 6A designated integral flanges, for surface applications.

For make-up torque for Fluoropolymer coated B7/L7 bolts and 2H nuts for surface applications, see page 10 of this document.

Refer to 17D Torque Chart on page 11 when using 6BX Flanges for Subsea Applications

See page 12 of this document for important notes.

Flange Size	Ring Gasket	Number of Bolts	Stud Bolt	Tap End Stud	Wrench Size	Torque* Ft. Lbs.
1-13/16" 10M	BX-151	8	3/4" x 5-1/2"	3/4 x 3-3/4"	1-1/4"	200
1-13/16" 10M 6BX TO 17SV	BX-151 SBX-151	8	3/4" x 6-1/2"	3/4 x 4-3/4"	1-1/4"	See Page 11
1-13/16" 15M	BX-151	8	7/8" x 6"	7/8" x 4-1/8"	1-7/16"	319
1-13/16" 20M	BX-151	8	1" x 7-3/4"	1" x 5-1/8"	1-5/8"	474
2-1/16" 2M***	R-23 or RX-23	8	5/8" x 5"	5/8" x 3-5/8"	1-1/16"	115
2-1/16" 3M***	R-24 or RX-24	8	7/8" x 6-1/2"	7/8" x 4-5/8"	1-7/16"	319
2-1/16" 5M***	R-24 or RX-24	8	7/8" x 6-1/2"	7/8" x 4-5/8"	1-7/16"	319
2-1/16" 5M 17 SS TO SS	BX-152 SBX-152	8	7/8" x 6"	7/8" x 4-1/4"	1-7/16"	See Page 11
2-1/16" 5M 17 SS TO SV	BX-152 SBX-152	8	7/8" x 7"	7/8" x 5"	1-7/16"	See Page 11
2-1/16" 10M	BX-152	8	3/4" x 5-1/2"	3/4" x 3-7/8"	1-1/4"	200
2-1/16" 10M 6BX TO 17SV	BX-152 SBX-152	8	3/4" x 6-1/2"	3/4" x 4-3/4"	1-1/4"	See Page 11
2-1/16" 15M	BX-152	8	7/8" x 6-1/2"	7/8" x 4-3/8"	1-7/16"	319
2-1/16" 20M	BX-152	8	1-1/8" x 8-1/2"	1-1/8" x 5-3/4"	1-13/16"	686
2-9/16" 2M***	R-26 or RX-26	8	3/4" x 5-1/2"	3/4" x 4"	1-1/4"	200

* Make-up torque for "black" or "plated" B7/L7 bolts and 2H nuts using API BUL 5A3 / ISO 13678 thread compound. These torque values assume undamaged bolts, clean conditions and smooth bearing surfaces with generous lubrication of threads and bearing faces on nuts.

*** These current flanges previously had old API size and series designations. See Flange Cross Reference Chart on the WOODCO USA website.

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Flange Reference Chart

These torque values apply only to current API 6A, 16A, and 17D integral connectors.

For make-up torque for fluoropolymer coated B7/L7 bolts and 2H nuts see page 10 of this document.

Refer to 17D Torque Chart on page 11 when using 6BX Flanges for Subsea Applications

See page 12 of this document for important notes.

Flange Size	Ring Gasket	Number of Bolts	Stud Bolt	Tap End Stud	Wrench Size	Torque* Ft. Lbs.
2-9/16" 3M***	R-27 or RX-27	8	1" x 7"	1" x 5-1/8"	1-5/8"	474
2-9/16" 5M***	R-27 or RX-27	8	1" x 7"	1" x 5-1/8"	1-5/8"	474
2-9/16" 5M 17 SS TO SS	BX-153 SBX-153	8	1" x 6-1/2"	1" x 4-5/8"	1-5/8"	See Page 11
2-9/16" 5M 17 SS TO SV	BX-153 SBX-153	8	1" x 7-1/4"	1" x 5-3/8"	1-5/8"	See Page 11
2-9/16" 10M	BX-153	8	7/8" x 6-1/2"	7/8" x 4-3/8"	1-7/16"	319
2-9/16" 10M 6BX TO 17SV	BX-153 SBX-153	8	7/8" x 7-1/4"	7/8" x 5"	1-7/16"	See Page 11
2-9/16" 15M	BX-153	8	1" x 7-1/4"	1" x 4-7/8"	1-5/8"	474
2-9/16" 20M	BX-153	8	1-1/4" x 9-1/2"	1-1/4" x 6-1/4"	2"	953
3-1/8" 2M***	R-31 or RX-31	8	3/4" x 5-3/4"	3/4" x 4-1/8"	1-1/4"	200
3-1/8" 3M***	R-31 or RX-31	8	7/8" x 6-1/2"	7/8" x 4-5/8"	1-7/16"	319
3-1/8" 5M***	R-35 or RX-35	8	1-1/8" x 7-3/4"	1-1/8" x 5-5/8"	1-13/16"	686
3-1/8" 5M 17 SS TO SS	BX-154 SBX-154	8	1-1/8" x 7-1/4"	1-1/8" x 5-1/8"	1-13/16"	See Page 11
3-1/8" 5M 17 SS TO SV	BX-154 SBX-154	8	1-1/8" x 8"	1-1/8" x 5-3/4"	1-13/16"	See Page 11

* Make-up torque for "black" or "plated" B7/L7 bolts and 2H nuts using API BUL 5A3 / ISO 13678 thread compound. These torque values assume undamaged bolts, clean conditions and smooth bearing surfaces with generous lubrication of threads and bearing faces on nuts.

*** These current flanges previously had old API size and series designations. See Flange Cross Reference Chart on the WOODCO USA website.

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Flange Reference Chart

These torque values apply only to current API 6A, 16A, and 17D integral connectors.

For make-up torque for fluoropolymer coated B7/L7 bolts and 2H nuts see page 10 of this document.

Refer to 17D Torque Chart on page 11 when using 6BX Flanges for Subsea Applications

See page 12 of this document for important notes.

Flange Size	Ring Gasket	Number of Bolts	Stud Bolt	Tap End Stud	Wrench Size	Torque* Ft. Lbs.
3-1/16" 10M	BX-154	8	1" x 7-1/4"	1" x 5"	1-5/8"	474
3-1/16" 10M 6BX TO 17SV	BX-154 SBX-154	8	1" x 8"	1" x 5-3/4"	1-5/8"	See Page 11
3-1/16" 15M	BX-154	8	1-1/8" x 8"	1-1/8" x 5-1/2"	1-13/16"	686
3-1/16" 20M	BX-154	8	1-3/8" x 10-1/4"	1-3/8" x 6-3/4"	2-3/16"	1,281
4-1/16" 2M***	R-37 or RX-37	8	7/8" x 6-1/2"	7/8" x 4-5/8"	1-7/16"	319
4-1/16" 3M***	R-37 or RX-37	8	1-1/8" x 7-1/2"	1-1/8" x 5-1/2"	1-13/16"	686
4-1/16" 5M***	R-39 or RX-39	8	1-1/4" x 8-1/2"	1-1/4" x 6-1/8"	2"	953
4-1/16" 5M 17 SS TO SS	BX-155 SBX-155	8	1-1/4" x 8"	1-1/4" x 5-5/8"	2"	See Page 11
4-1/16" 5M 17 SS TO SV	BX-155 SBX-155	8	1-1/4" x 8-3/4"	1-1/4" x 6-1/4"	2"	See Page 11
4-1/16" 10M	BX-155	8	1-1/8" x 8-1/2"	1-1/8" x 5-3/4"	1-13/16"	686
4-1/16" 10M 6BX TO 17SV	BX-155 SBX-155	8	1-1/8" x 9-1/2"	1-1/8" x 6-5/8"	1-13/16"	See Page 11
4-1/16" 15M	BX-155	8	1-3/8" x 9-3/4"	1-3/8" x 6-1/2"	2-3/16"	1,281

* Make-up torque for "black" or "plated" B7/L7 bolts and 2H nuts using API BUL 5A3 / ISO 13678 thread compound. These torque values assume undamaged bolts, clean conditions and smooth bearing surfaces with generous lubrication of threads and bearing faces on nuts.

*** These current flanges previously had old API size and series designations. See Flange Cross Reference Chart on the WOODCO USA website.

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Flange Reference Chart

These torque values apply only to current API 6A, 16A, and 17D integral connectors.

For make-up torque for fluoropolymer coated B7/L7 bolts and 2H nuts see page 10 of this document.

Refer to 17D Torque Chart on page 11 when using 6BX Flanges for Subsea Applications

See page 12 of this document for important notes.

Flange Size	Ring Gasket	Number of Bolts	Stud Bolt	Tap End Stud	Wrench Size	Torque* Ft. Lbs.
4-1/16" 20M	BX-155	8	1-3/4" x 12-1/2"	1-3/4" x 8-3/8"	2-3/4"	2,696
5-1/8" 2M***	R-41 or RX-41	8	1" x 7-1/4"	1" x 5-1/4"	1-5/8"	474
5-1/8" 3M***	R-41 or RX-41	8	1-1/4" x 8-1/4"	1-1/4" x 6"	2"	953
5-1/8" 5M***	R-44 or RX-44	8	1-1/2" x 10-1/2"	1-1/2" x 7-3/8"	2-3/8"	1,677
5-1/8" 5M 17 SS TO SS	BX-169 SBX-169	8	1-1/2" x 10"	1-1/2" x 6-7/8"	2-3/8"	See Page 11
5-1/8" 5M 17 SS TO SV	BX-169 SBX-169	8	1-1/2" x 11"	1-1/2" x 7-3/4"	2-3/8"	See Page 11
5-1/8" 10M	BX-169	12	1-1/8" x 9-1/4"	1-1/8" x 6"	1-13/16"	686
5-1/8" 10M 6BX TO 17SV	BX-169 SBX-169	12	1-1/8" x 10-1/4"	1-1/8" x 7"	1-13/16"	See Page 11
5-1/8" 15M	BX-169	12	1-1/2" x 11-1/2"	1-1/2" x 7-5/8"	2-3/8"	1,677
7-1/16" 2M***	R-45 or RX-45	12	1" x 7-1/2"	1" x 5-3/8"	1-5/8"	474
7-1/16" 3M***	R-45 or RX-45	12	1-1/8" x 8-1/2"	1-1/8" x 5-7/8"	1-13/16"	686
7-1/16" 5M***	R-46 or RX-46	12	1-3/8" x 11-1/4"	1-3/8" x 7-1/2"	2-3/16"	1,281

* Make-up torque for "black" or "plated" B7/L7 bolts and 2H nuts using API BUL 5A3 / ISO 13678 thread compound. These torque values assume undamaged bolts, clean conditions and smooth bearing surfaces with generous lubrication of threads and bearing faces on nuts.

*** These current flanges previously had old API size and series designations. See Flange Cross Reference Chart on the WOODCO USA website.

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Flange Reference Chart

These torque values apply only to current API 6A, 16A, and 17D integral connectors.

For make-up torque for fluoropolymer coated B7/L7 bolts and 2H nuts see page 10 of this document.

Refer to 17D Torque Chart on page 11 when using 6BX Flanges for Subsea Applications

See page 12 of this document for important notes.

Flange Size	Ring Gasket	Number of Bolts	Stud Bolt	Tap End Stud	Wrench Size	Torque* Ft. Lbs.
7-1/16" 5M 17 SS TO SS	BX-156 SBX-156	12	1-3/8" x 10-3/4"	1-3/8" x 7"	2-3/16"	See Page 11
7-1/16" 5M 17 SS TO SV	BX-156 SBX-156	12	1-3/8" x 11-3/4"	1-3/8" x 8-1/8"	2-3/16"	See Page 11
7-1/16" 10M	BX-156	12	1-1/2" x 11-3/4"	1-1/2" x 7-3/4"	2-3/8"	1,677
7-1/16" 10M 6BX TO 17SV	BX-156 SBX-156	12	1-1/2" x 13"	1-1/2" x 9"	2-3/8"	See Page 11
7-1/16" 15M	BX-156	16	1-1/2" x 13"	1-1/2" x 8-3/8"	2-3/8"	1,677
7-1/16" 20M	BX-156	16	2" x 17-3/4"	2" x 11-1/8"	3-1/8"	4,061
9" 2M***	R-49 or RX-49	12	1-1/8" x 8-1/2"	1-1/8" x 5-7/8"	1-13/16"	686
9" 3M***	R-49 or RX-49	12	1-3/8" x 9-1/2"	1-3/8" x 6-3/4"	2-3/16"	1,281
9" 5M***	R-50 or RX-50	12	1-5/8" x 12-1/2"	1-5/8" x 8-1/2"	2-9/16"	2,146
9" 5M 17 SS TO SS	BX-157 SBX-157	12	1-5/8" x 12"	1-5/8" x 8"	2-9/16"	See Page 11
9" 5M 17 SS TO SV	BX-157 SBX-157	12	1-5/8" x 13-1/4"	1-5/8" x 9-1/8"	2-9/16"	See Page 11
9" 10M	BX-157	16	1-1/2" x 13-1/2"	1-1/2" x 8-1/2"	2-3/8"	1,677

* Make-up torque for "black" or "plated" B7/L7 bolts and 2H nuts using API BUL 5A3 / ISO 13678 thread compound. These torque values assume undamaged bolts, clean conditions and smooth bearing surfaces with generous lubrication of threads and bearing faces on nuts.

*** These current flanges previously had old API size and series designations. See Flange Cross Reference Chart on the WOODCO USA website.

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Flange Reference Chart

These torque values apply only to current API 6A, 16A, and 17D integral connectors.

For make-up torque for fluoropolymer coated B7/L7 bolts and 2H nuts see page 10 of this document.

Refer to 17D Torque Chart on page 11 when using 6BX Flanges for Subsea Applications

See page 12 of this document for important notes.

Flange Size	Ring Gasket	Number of Bolts	Stud Bolt	Tap End Stud	Wrench Size	Torque* Ft. Lbs.
9" 10M 6BX TO 17SV	BX-157 SBX-157	16	1-1/2" x 15"	1-1/2" x 10-1/8"	2-3/8"	See Page 11
9" 15M	BX-157	16	1-7/8" x 16"	1-7/8" x 10-1/8"	2-15/16"	3,332
9" 20M	BX-157	16	2-1/2" x 21-3/4"	2-1/2" x 13-3/4"	3-7/8"	8,030
11" 2M***	R-53 or RX-53	16	1-1/4" x 9-1/4"	1-1/4" x 6-1/2"	2"	953
11" 3M***	R-53 or RX-53	16	1-3/8" x 10"	1-3/8" x 7"	2-3/16"	1,281
11" 5M***	R-54 or RX-54	12	1-7/8" x 14-1/4"	1-7/8" x 9-5/8"	2-15/16"	3,332
11" 5M 17 SS TO SS	BX-158 SBX-158	12	1-7/8" x 13-3/4"	1-7/8" x 9-1/8"	2-15/16"	See Page 11
11" 5M 17 SS TO SV	BX-158 SBX-158	12	1-7/8" x 15-1/4"	1-7/8" x 10-1/2"	2-15/16"	See Page 11
11" 10M	BX-158	16	1-3/4" x 15-1/4"	1-3/4" x 9-3/4"	2-3/4"	2,696
11" 10M 6BX TO 17SV	BX-158 SBX-158	16	1-3/4" x 17"	1-3/4" x 11-1/2"	2-3/4"	See Page 11
11" 15M	BX-158	20	2" x 19-1/2"	2" x 12"	3-1/8"	4,061
11" 20M	BX-158	16	2-3/4" x 23-3/4"	2-3/4" x 15"	4-1/4"	9,712

* Make-up torque for "black" or "plated" B7/L7 bolts and 2H nuts using API BUL 5A3 / ISO 13678 thread compound. These torque values assume undamaged bolts, clean conditions and smooth bearing surfaces with generous lubrication of threads and bearing faces on nuts.

*** These current flanges previously had old API size and series designations. See Flange Cross Reference Chart on the WOODCO USA website.

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Flange Reference Chart

These torque values apply only to current API 6A, 16A, and 17D integral connectors.

For make-up torque for fluoropolymer coated B7/L7 bolts and 2H nuts see page 10 of this document.

Refer to 17D Torque Chart on page 11 when using 6BX Flanges for Subsea Applications

See page 12 of this document for important notes.

Flange Size	Ring Gasket	Number of Bolts	Stud Bolt	Tap End Stud	Wrench Size	Torque* Ft. Lbs.
13-5/8" 2M***	R-57 or RX-57	20	1-1/4" x 9-1/2"	1-1/4" x 6-5/8"	2"	726**
13-5/8 3M***	R-57 or RX-57	20	1-3/8" x 10-3/4"	1-3/8" x 7-3/8"	2-3/16"	976**
13-5/8" 5M	BX-160	16	1-5/8" x 12-3/4"	1-5/8" x 8-3/8"	2-9/16"	2,146
13-5/8" 10M	BX-159	20	1-7/8" x 17-3/4"	1-7/8" x 11"	2-15/16"	3,332
13-5/8" 10M 6BX TO 17SV	BX-159 SBX-159	20	1-7/8" x 19-3/4"	1-7/8" x 13-1/8"	2-15/16"	See Page 11
13-5/8" 15M	BX-159	20	2-1/4" x 21-1/4"	2-1/4" x 13-1/4"	3-1/2"	5,822
13-5/8" 20M	BX-159	20	3" x 29-3/4"	3" x 18-1/8"	4-5/8"	12,654
16-3/4" 2M***	R-65 or RX-65	20	1-1/2" x 10-3/4"	1-1/2" x 7-1/2"	2-3/8"	1,278**
16-3/4" 3M***	R-66 or RX-66	20	1-5/8" x 12-1/4"	1-5/8" x 8-3/8"	2-9/16"	2,146
16-3/4" 5M	BX-162	16	1-7/8" x 14-3/4"	1-7/8" x 9-1/2"	2-15/16"	3,332
16-3/4" 10M	BX-162	24	1-7/8" x 17-3/4"	1-7/8" x 11"	2-15/16"	3,332
18-3/4" 5M	BX-163	20	2" x 17-3/4"	2" x 11-1/4"	3-1/8"	4,061
18-3/4" 10M	BX-164	24	2-1/4" x 22-3/4"	2-1/4" x 14"	3-1/2"	5,822
18-3/4" 15M	BX-164	20	3" x 26-3/4"	3" x 16-3/4"	4-5/8"	12,654

* Make-up torque for "black" or "plated" B7/L7 bolts and 2H nuts using API BUL 5A3 / ISO 13678 thread compound. These torque values assume undamaged bolts, clean conditions and smooth bearing surfaces with generous lubrication of threads and bearing faces on nuts.

** These API Spec. 6A flanges have stress limits that necessitate lower than normal torque values for bolts used in these flanges.

*** These current flanges previously had old API size and series designations. See Flange Cross Reference Chart on the WOODCO USA website.

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Flange Reference Chart

These torque values apply only to current API 6A, 16A, and 17D integral connectors.

For make-up torque for fluoropolymer coated B7/L7 bolts and 2H nuts see page 10 of this document.

Refer to 17D Torque Chart on page 11 when using 6BX Flanges for Subsea Applications

See page 12 of this document for important notes.

Flange Size	Ring Gasket	Number of Bolts	Stud Bolt	Tap End Stud	Wrench Size	Torque* Ft. Lbs.
20-3/4" 3M***	R-74 or RX-74	20	2" x 15"	2" x 10-1/8"	3-1/8"	4,061
21-1/4" 2M***	R-73 or RX-73	24	1-5/8" x 12-1/4"	1-5/8" x 8-3/8"	2-9/16"	1,635**
21-1/4" 5M	BX-165	24	2" x 19"	2" x 11-3/4"	3-1/8"	4,061
21-1/4" 10M	BX-166	24	2-1/2" x 24-3/4"	2-1/2" x 15-1/8"	3-7/8"	8,030
26-3/4" 2M	BX-167	20	1-3/4" x 14-1/4"	1-3/4" x 9-1/8"	2-3/4"	2,696
26-3/4" 3M	BX-168	24	2" x 17-1/2"	2" x 11"	3-1/8"	4,061
30" 300 MSS ¹	R-95 or RX-	28	1-3/4" x 13-1/2"	1-3/4" x 9-1/8"	2-3/4"	2,696
30" 600 MSS ^{1,2}	R-95 or RX-95	28	2" x 15-3/4"	2" x 10-1/2"	3-1/8"	4,061
30" 900 MSS ^{1,2}	R-102 or RX-102	20	3" x 14"	3" x 20-1/2"	4-5/8"	7,400**
30" 2M	BX-303	32	1-5/8" x 14-1/2"	1-5/8" x 9-1/4"	2-9/16"	2,146
30" 3M	BX-303	32	1-7/8" x 17-3/4"	1-7/8" x 11"	2-15/16"	3,332

* Make-up torque for "black" or "plated" B7/L7 bolts and 2H nuts using API BUL 5A3 / ISO 13678 thread compound. These torque values assume undamaged bolts, clean conditions and smooth bearing surfaces with generous lubrication of threads and bearing faces on nuts.

** These flanges have stress limits that necessitate lower than normal torque values for bolts used in these flanges.

*** These current flanges previously had old API size and series designations. See Flange Cross Reference Chart on the WOODCO USA website.

¹ Not API, See MSS SP-44 published by the Manufacturers Standardization Society.

² This MSS flange requires longer bolts for connections between full bore flanges and blind flanges.

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Flange Reference Chart

Torque Values for API Spec 6A Integral Flanges Using Fluoropolymer Coated Bolts For Surface Applications

These torques assume undamaged bolts, clean conditions and smooth bearing surfaces.

The torque values shown in this table will apply 50% yield tension in the bolts.

Stud Diameter	5/8"	3/4"	7/8"	1"	1-1/8"	1-1/4" *	1-3/8" *	1-1/2" *	1-5/8" *	1-3/4"	1-7/8"
Torque Ft. Lbs.	68	118	188	279	401	553	739	962	1,226	1,534	1,890

Stud Diameter	2"	2-1/4"	2-1/2"	2-5/8"	2-3/4"	3"	3-1/4"	3-3/4"	3-7/8"	4"
Torque Ft. Lbs.	2,297	3,276	4,500	4,716	5,424	7,047	8,965	13,782	15,208	16,730

* Certain API Spec. 6A flanges have stress limits that necessitate lower than normal torque values for bolts used in these flanges. Use the chart below for these flanges.

The torque values shown in this table will apply 40,000 psi stress in the bolts.

Flange Size	13-5/8" 2M	13-5/8" 3M	16-3/4" 2M	21-1/4" 2M
Stud Diameter	1-1/4"	1-3/8"	1-1/2"	1-5/8"
Torque Ft. Lbs.	421	563	733	934

Look to www.woodcousa.com as "The Source".

Flange Reference Chart

Torque Values for 17D and 6BX Flange Bolts for Subsea Applications

For Flange Bolts and Nuts
Having Fluoropolymer Coating

See Caution Below

Bolt Size	Hex Nut Size Across Flats	Minimum 67% Yield Stress *		Maximum 70% Yield Stress *	
		Bolt Tension lbf	Make up Torque ft lbs	Bolt Tension lbf	Make up Torque ft lbs
3/4 - 10 UNC	1-1/4	23,530	160	24,538	167
7/8 - 9 UNC	1-7/16	32,483	253	33,937	264
1 - 8 UN	1-5/8	42,614	376	44,522	393
1-1/8 - 8 UN	1-13/16	55,608	539	58,098	564
1-1/4 - 8 UN	2	70,330	744	73,478	777
1-3/8 - 8 UN	2-3/16	86,777	994	90,662	1,038
1-1/2 - 8 UN	2-3/8	104,951	1,294	109,650	1,352
1-5/8 - 8 UN	2-9/16	124,852	1,649	130,442	1,723
1-3/4 - 8 UN	2-3/4	146,480	2,063	153,038	2,155
1-7/8 - 8 UN	2-15/16	169,833	2,541	177,438	2,654
2 - 8 UN	3-1/8	194,914	3,087	203,642	3,225
2-1/4 - 8 UN	3-1/2	250,256	4,402	261,461	4,599
2-1/2 - 8 UN	3-7/8	312,504	6,044	326,497	6,315
2-3/4 - 8 UN**	4-1/4	345,310	7,284	360,772	7,611
3 - 8 UN**	4-5/8	414,127	9,443	432,670	9,866
3-1/4 - 8 UN**	5	489,194	12,013	511,098	12,551

* Torque ft lbs calculated to give % of yield tension stress for ASTM A193 B7 or ASTM A320 L7 bolts using ASTM A194 GR. 2H nuts with Fluoropolymer coating (Coefficient of Friction = 0.07).

** Torque calculated same as above based on reduced yield strength of 95,000 psi.

CAUTION: API Spec 17D requires flange connection bolt tightness (tension stress in the bolt) equal to 67% to 70% of the specified minimum yield strength of L7/B7 bolts. Operators should limit these higher tensions to only subsea flange connections that use BX or SBX ring gaskets and have designs that will allow face to face make-up. When using some lubricants and/or anti-corrosion coatings on bolts, tightening bolts consistent with the torque table shown above may in fact produce tension closer to the actual yield strength of the bolts. Operators should use an alternate method to measure tension in the bolts to confirm the applicability of this table.

Look to www.woodcousa.com as "The Source".

Flange Reference Chart Important Notes

Obsolete, Discontinued or Withdrawn flanges not included in this chart also use B7/L7 connecting bolts. For bolt sizes and torque values for these flanges, see individual flange pages in the [Flange Slide Rule Program](#) on the www.woodcousa.com web site.

For bolt tightening sequence for API flanges, see individual flange pages in the [Bolt Tightening Sequence](#) index on the www.woodcousa.com web site.

Flanges with "R" ring grooves can connect and seal with either R or RX ring gaskets. RX gaskets increase the stand-off between flanges, and studs shown on this chart have sufficient length to accommodate RX gaskets in these connections. In some cases equipment design may restrict clearance and shorter studs will increase convenience. For information on these shorter stud lengths, see AWHEM document TR9501 at www.awhem.org/docs.htm. To compare the difference in stand-off see <http://www.woodcousa.com/standoff.htm#Select>

Caution: The difference in stand-off between R and RX gaskets can cause alignment problems on close coupled manifolding or pressure controlling loops. Assembly designers specify component dimensions which allow for the difference in stand-off between flanges when choosing either R or RX gaskets. When operators perform maintenance that involves disassembly, trouble free reassembly requires using gaskets the same as the gaskets originally chosen.

Ring gaskets marked SRX or SBX have identical measurements to RX and BX ring gaskets with the the same number designation, and they will fit the same corresponding connectors. API Spec 17D intends SBX gaskets to seal all 17D SS and SV flanges and all 6BX flanges used for subsea applications. API Spec 17D intends SRX gaskets to seal only 5000 psi segmented flanges, not listed above. The "S" indicates these gaskets have vent holes to allow reliable connector make-up underwater (subsea). API Spec 17D requires that manufacturers use only corrosion resistant alloy as the material for these gaskets.

For more information about ring gaskets, see Web Site Tools, and click on Ring Gasket Handling and Inspection Before Assembly.

For more information about ring gasket sealing, see Web Site Tools, and click on Field Appraisal of Ring Grooves.

For more information about flange connection make-up, see Web Site Tools, and click on Flange Make-up, Stand-off and Drift.

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