

BOLTING AND TORQUING

CARBON STEEL L7, B7, B16 STUD TORQUEING STD. FOR HEAT EXCHANGERS AND PRESSURE VESSELS		TORQUE FOR PIPING FLANGES W/ SPIRAL WOUND GASKETS	
STUD DIA. INCHES	TORQUE FT. LBS	STUD DIA. INCHES	TORQUE FT. LBS
1/2	60	1/2	45
5/8	120	5/8	90
3/4	210	3/4	150
7/8	350	7/8	240
1	500	1	368
1-1/8	750	1-1/8	533
1-1/4	1050	1-1/4	750
1-3/8	1400	1-3/8	1020
1-1/2	1800	1-1/2	1200
1-5/8	2350	1-5/8	1650
1-3/4	2950	1-3/4	2250
1-7/8	3650	1-7/8	3000
2	4500	2	3300
2-1/4	6500	2-1/4	4770

SUGGESTION BASED ON ANSI STANDARD.
ALWAYS CHECK SPECIFICATIONS FOR YOUR GASKET AND JOB SITE

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FLANGE KITS

150# FLANGE

FLANGE KIT SIZE	NUMBER OF STUDS	BOLT SIZE	WRENCH SIZE
1/2	4	1/2 X 2-1/2	7/8
3/4	4	1/2 X 3	7/8
1	4	1/2 X 3	7/8
1-1/4	4	1/2 X 3	7/8
1-1/2	4	1/2 X 3	7/8
2	4	5/8 X 3-1/2	1-1/16
2-1/2	4	5/8 X 4	1-1/16
3	4	5/8 X 4	1-1/16
4	8	5/8 X 4	1-1/16
5	8	5/8 X 4	1-1/4
6	8	3/4 X 4-1/2	1-1/4
8	8	3/4 X 4-1/2	1-1/4
10	12	7/8 X 5	1-7/16
12	12	7/8 X 5	1-7/16
14	12	1 X 6	1-5/8
16	16	1 X 6	1-5/8
18	16	1-1/8 X 6-1/2	1-13/16
20	20	1-1/8 X 7	1-13/16
24	20	1-1/4 X 7-1/2	2

ALL KITS CONTAIN B7 STUDS WITH DOUBLE HVY HEX G2H NUTS UNLESS OTHER IS SPECIFIED

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FLANGE KITS

300# FLANGE

FLANGE KIT SIZE	NUMBER OF STUDS	BOLT SIZE	WRENCH SIZE
1/2	4	1/2 X 3	7/8
3/4	4	5/8 X 3-1/2	1-1/16
1	4	5/8 X 3-1/2	1-1/16
1-1/2	4	3/4 X 4	1-1/4
2	8	5/8 X 4	1-1/16
3	8	3/4 X 4-1/2	1-1/4
4	8	3/4 X 5	1-1/4
6	12	3/4 X 5	1-1/4
8	12	7/8 X 6	1-7/16
10	16	1 X 7	1-5/8
12	16	1-1/8 X 7-1/2	1-13/16
14	20	1-1/8 X 7-1/2	1-13/16
16	20	1-1/4 X 8	2
18	24	1-1/4 X 8-1/2	2
20	24	1-1/4 X 9	2
24	24	1-1/2 X 10	2-3/8

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FLANGE KITS

600# FLANGE

FLANGE KIT SIZE	NUMBER OF STUDS	BOLT SIZE	WRENCH SIZE
1/2	4	1/2 X 3-1/2	7/8
3/4	4	5/8 X 4	1-1/16
1	4	3/4 X 4-1/2	1-1/16
1-1/2	4	5/8 X 4-1/2	1-1/4
2	8	3/4 X 5-1/2	1-1/16
3	8	7/8 X 6	1-1/4
4	8	1 X 7-1/2	1-7/16
6	12	1-1/8 X 8-1/2	1-5/8
8	12	1-1/4 X 9	1-13/16
10	16	1-1/4 X 9-1/2	2
12	20	1-1/4 X 9-1/2	2
14	20	1-3/8 X 10	1-3/16
16	20	1-1/2 X 10-1/2	2-3/8
18	20	1-5/8 X 11-1/2	2-9/16
20	24	1-5/8 X 12	2-9/16
24	24	1-7/8 X 14	2-15/16

ALL KITS CONTAIN B7 STUDS WITH DOUBLE HVY HEX G2H NUTS UNLESS OTHER IS SPECIFIED

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FLANGE KITS

900# FLANGE

FLANGE KIT SIZE	NUMBER OF STUDS	BOLT SIZE	WRENCH SIZE
1/2	4	3/4 X 4-1/2	1-1/4
3/4	4	3/4 X 4-1/2	1-1/4
1	4	7/8 X 5	1-7/16
1-1/2	4	1 X 5	1-5/8
2	8	7/8 X 6	1-7/16
3	8	7/8 X 6	1-7/16
4	8	1-1/8 X 6-1/2	1-13/16
6	12	1-1/8 X 7-1/2	1-13/16
8	12	1-3/8 X 8-1/2	2-3/16
10	16	1-3/8 X 9	2-3/16
12	20	1-3/8 X 9-1/2	2-3/16
14	20	1-1/2 X 9-1/2	2-3/8
16	20	1-5/8 X 10	2-9/16
18	20	1-7/8 X 12-1/2	2-15/16
20	24	2 X 13	3-1/8
24	24	2-1/2 X 17	3-7/8

ALL KITS CONTAIN B7 STUDS WITH DOUBLE HVY HEX G2H NUTS UNLESS OTHER IS SPECIFIED

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FLANGE KITS

1500# FLANGE

FLANGE KIT SIZE	NUMBER OF STUDS	BOLT SIZE	WRENCH SIZE
1/2	4	3/4 X 4-1/4	1-1/4
3/4	4	3/4 X 4-1/2	1-1/4
1	4	7/8 X 5	1-7/16
1-1/2	4	1 X 5-1/2	1-5/8
2	8	7/8 X 5-3/4	1-7/16
3	8	1-1/8 X 7	1-13/16
4	8	1-1/4 X 7-3/4	2
6	12	1-3/8 X 10-1/4	2-3/16
8	12	1-5/8 X 11-1/2	2-9/16
10	12	1-7/8 X 13-1/4	2-15/16
12	16	2 X 14-3/4	3-1/8
14	16	2-1/4 X 16	3-1/2
16	16	2-1/2 X 17-1/2	3-7/8
18	16	2-3/4 X 19-1/4	4-1/4
20	16	3 X 21-1/4	4-5/8
24	16	3-1/2 X 24-1/4	5-3/8

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FIGURE 1
Bolting Sequence Patterns
8 BOLTS

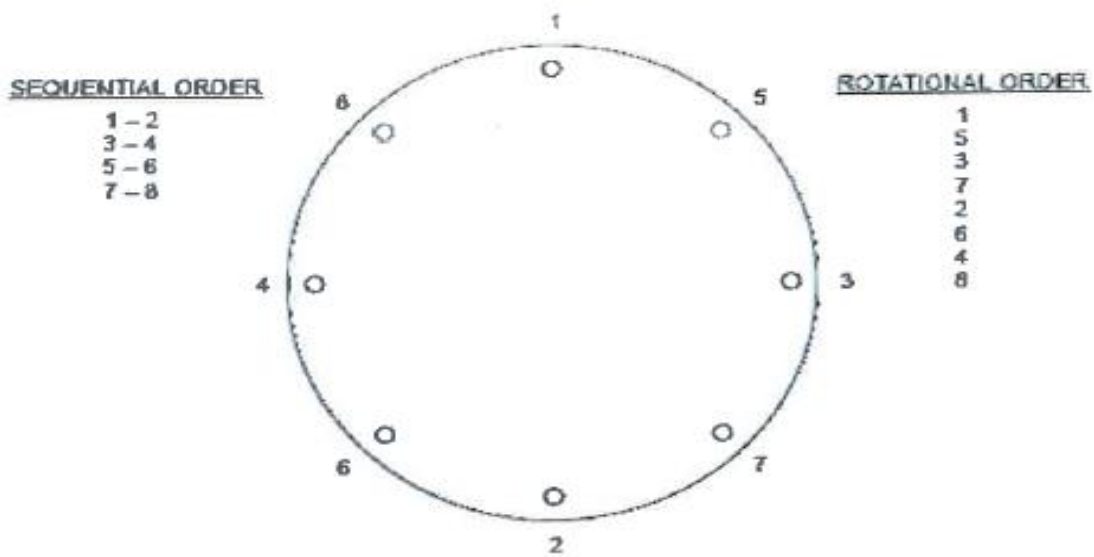
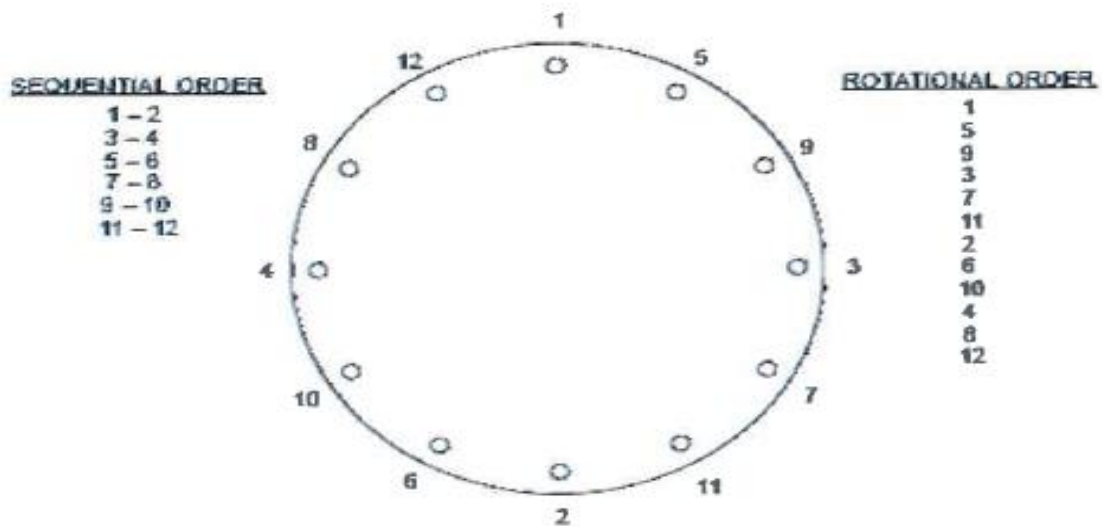


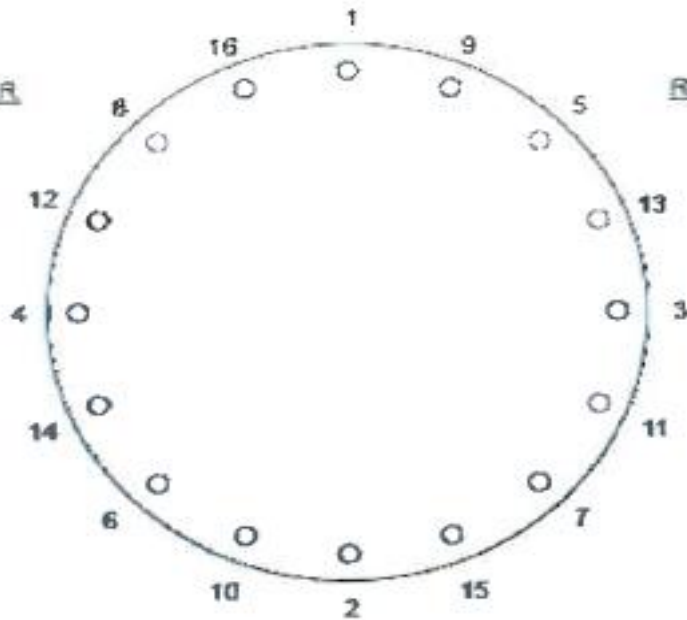
FIGURE 2
12 BOLTS



16 BOLTS

SEQUENTIAL ORDER

- 1 - 2
- 3 - 4
- 5 - 6
- 7 - 8
- 9 - 10
- 11 - 12
- 13 - 14
- 15 - 16



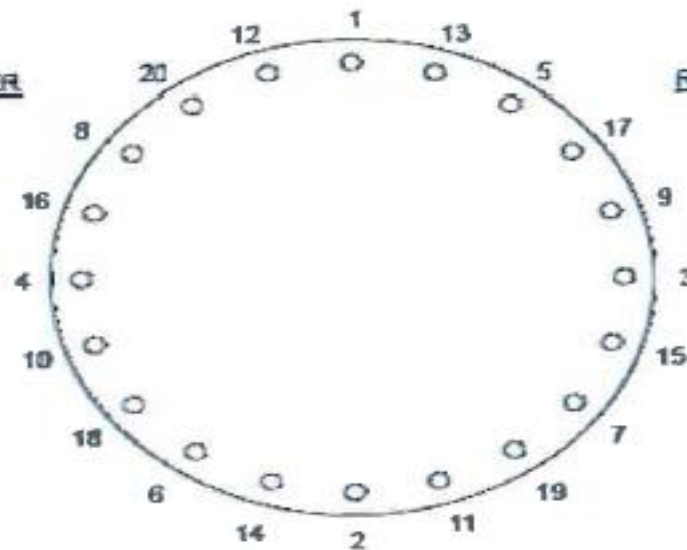
ROTATIONAL ORDER

- 1
- 9
- 5
- 13
- 3
- 11
- 7
- 15
- 2
- 10
- 6
- 14
- 4
- 12
- 8
- 16

FIGURE 4
20 BOLTS

SEQUENTIAL ORDER

- 1 - 2
- 3 - 4
- 5 - 6
- 7 - 8
- 9 - 10
- 11 - 12
- 13 - 14
- 15 - 16
- 17 - 18
- 19 - 20



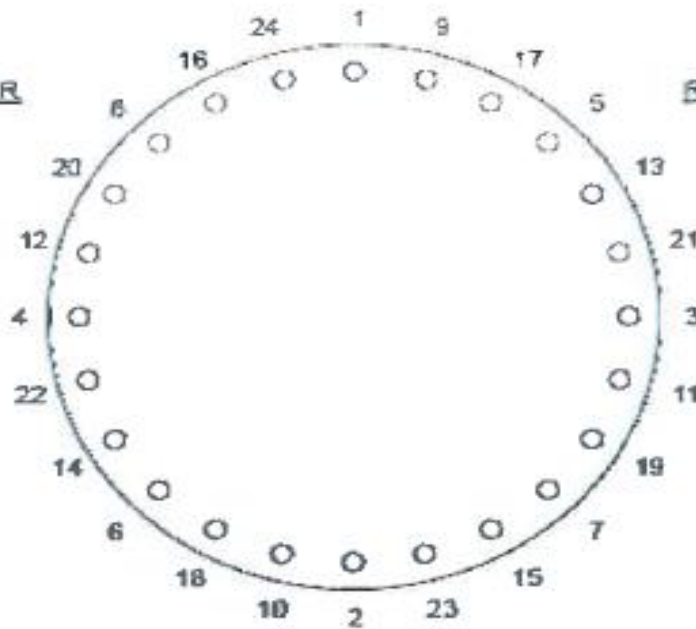
ROTATIONAL ORDER

- 1
- 13
- 5
- 17
- 9
- 3
- 15
- 7
- 19
- 11
- 2
- 14
- 6
- 18
- 10
- 4
- 16
- 8
- 20
- 12

24 BOLTS

SEQUENTIAL ORDER

- 1 - 2
- 3 - 4
- 5 - 6
- 7 - 8
- 9 - 10
- 11 - 12
- 13 - 14
- 15 - 16
- 17 - 18
- 19 - 20
- 21 - 22
- 23 - 24



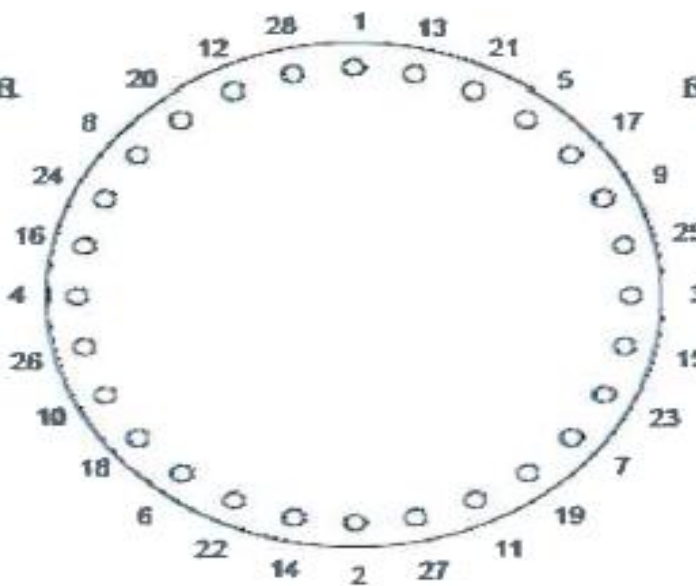
ROTATIONAL ORDER

- 1
- 9
- 17
- 5
- 13
- 21
- 3
- 11
- 19
- 7
- 15
- 23
- 2
- 10
- 18
- 6
- 14
- 22
- 4
- 12
- 20
- 8
- 16
- 24

FIGURE 6
28 BOLTS

SEQUENTIAL ORDER

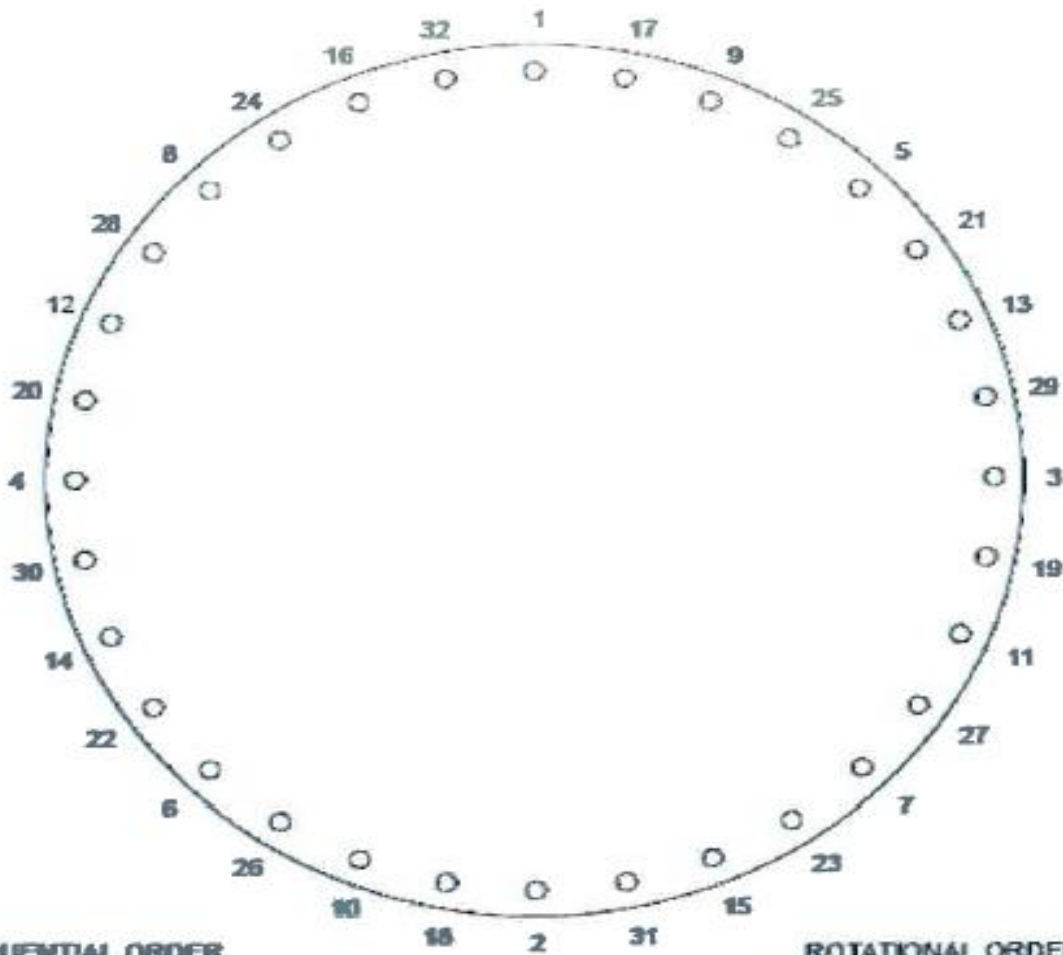
- 1 - 2
- 3 - 4
- 5 - 6
- 7 - 8
- 9 - 10
- 11 - 12
- 13 - 14
- 15 - 16
- 17 - 18
- 19 - 20
- 21 - 22
- 23 - 24
- 25 - 26
- 27 - 28



ROTATIONAL ORDER

- 1
- 13
- 21
- 5
- 17
- 9
- 25
- 3
- 15
- 23
- 7
- 19
- 11
- 27
- 2
- 14
- 22
- 6
- 18
- 10
- 26
- 4
- 16
- 24
- 8
- 20
- 12
- 28

32 BOLTS



SEQUENTIAL ORDER

1-2	↔	17-18
3-4	↔	19-20
5-6	↔	21-22
7-8	↔	23-24
9-10	↔	25-26
11-12	↔	27-28
13-14	↔	29-30
15-16	↔	31-32

ROTATIONAL ORDER

1	↔	3	↔	2	↔	4
17	↔	19	↔	18	↔	20
9	↔	11	↔	10	↔	12
25	↔	27	↔	26	↔	28
5	↔	7	↔	6	↔	8
21	↔	23	↔	22	↔	24
13	↔	15	↔	14	↔	16
29	↔	31	↔	30	↔	32

