

BOLTED FLANGE JOINT ASSEMBLY
WORKSHEETS
FOR RAILROAD TANK CARS

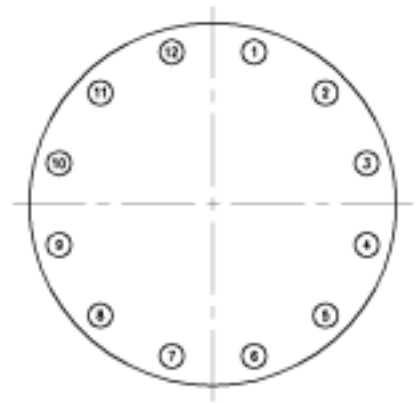
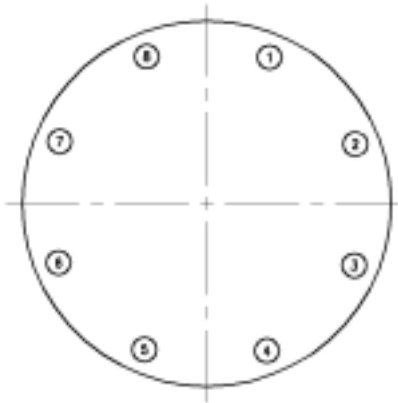
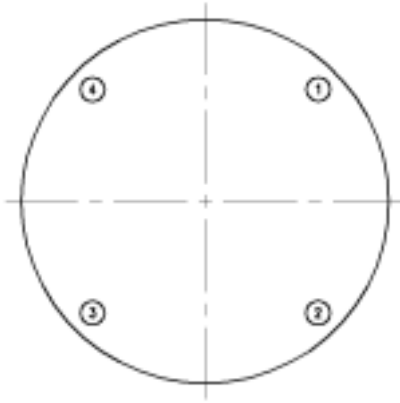
Provided as a service by

GASKET RESOURCES INC.
Technical Services Division

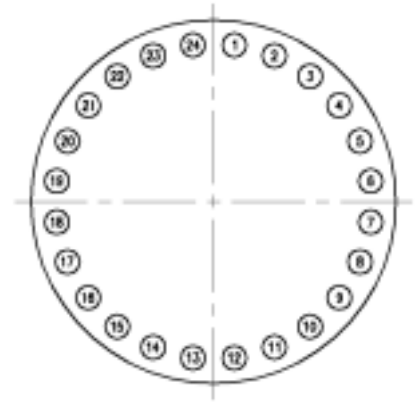
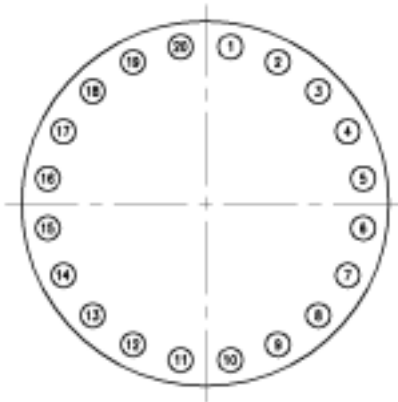
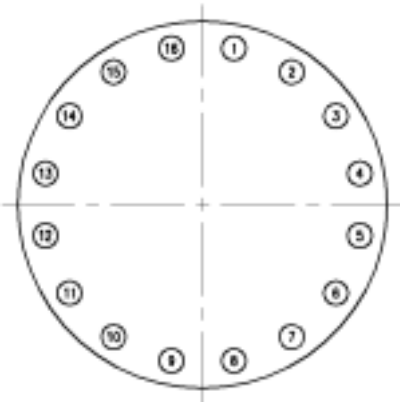
February 2004

Bolt Tightening Worksheet

Cross-Pattern Bolt Tightening Sequences



<p>4 Bolts: 1 – 3 – 2 – 4</p>	<p>8 Bolts: 1-5-3-7 → 2-6-4-8</p>	<p>12 Bolts 1-7-4-10 → 2-8-5-11 → 3-9-6-12</p>
-----------------------------------	---------------------------------------	--



<p>16 Bolts 1-9-5-13 → 3-11-7-15 → 2-10-6-14 → 4-12-8-16</p>	<p>20 Bolts: 1-11-6-16 → 3-13-8-18 → 5-15-10-20 → 2-12-7-17 → 4-14-9-19</p>	<p>24 Bolts 1-13-7-19 → 4-16-10-22 → 2-14-8-20 → 5-17-11-23 → 3-15-9-21 → 6-18-12-24</p>
--	---	--

WARNING: Bolts must be tightened in the cross-pattern tightening sequence and employing the incremental rounds of tightening as prescribed in this procedure. If this is not done, the flanges may become cocked relative to each other, an indicator of non-uniform gasket loading and potential joint leakage. This is particularly true the smaller the flange bolt circle and the fewer the number of bolts.

DURLON® Gasketing is Manufactured
to ISO 9001 Quality Standards

Gasket Resources Inc.
Exton, PA 19341-0565

Technical:
(713) 467-1316, FAX: (713) 467-1326
e-mail: tech@durlon.com

Website: www.gasketresources.com