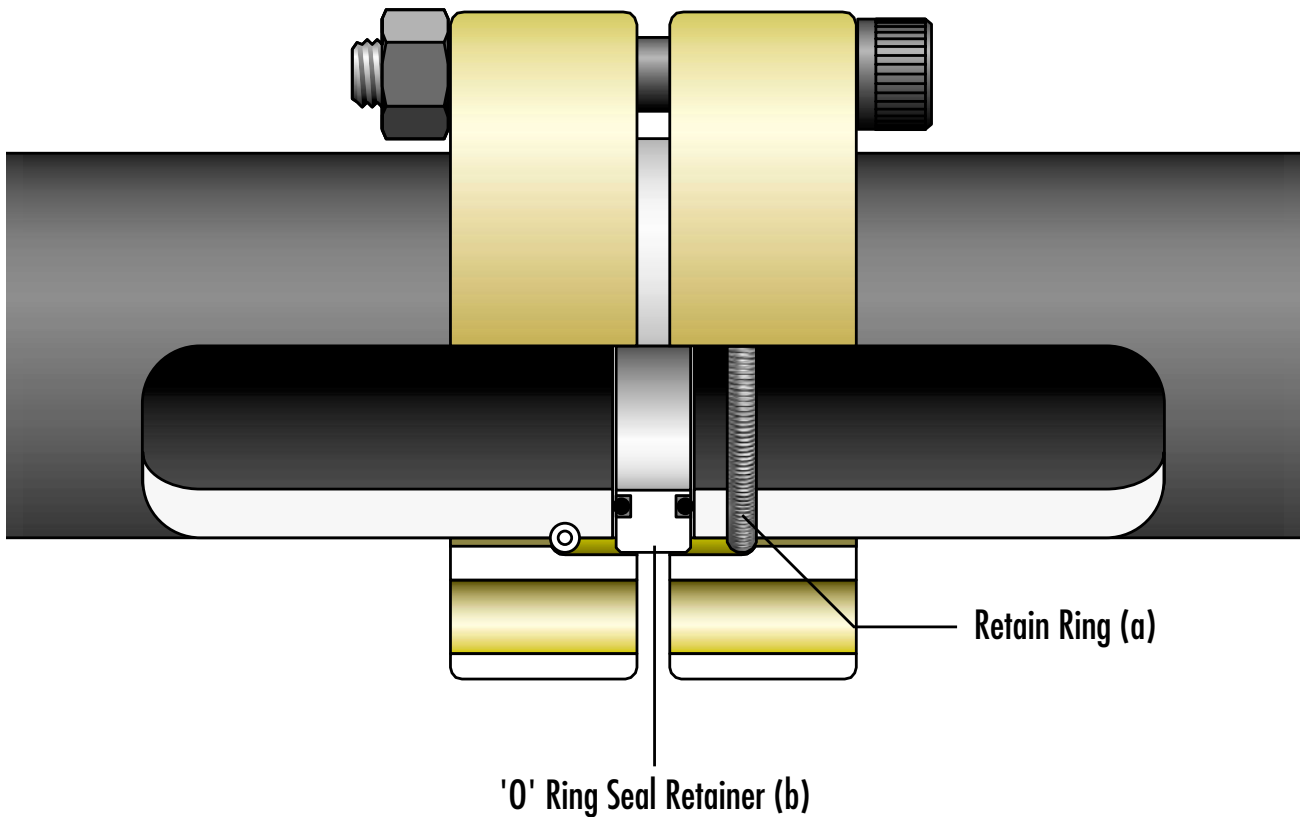


Retain Ring System



The retain ring configuration uses heavy wall pipe and has a machined butt end face, along with an annular groove on the outside diameter.

After machining, the flange is slipped onto the pipe and a retain ring (a) which consists of a segmented stainless steel ring bound by a spiral wound stainless steel spring is sprung over the pipe's outside diameter nesting in the annular groove. Bolting the flanges together draws them against the retain rings with the 'o'ring seal retainer (b) captive within the connection.

Pipe sizes 1 1/2" through 10" are available for use with retain ring flanges.

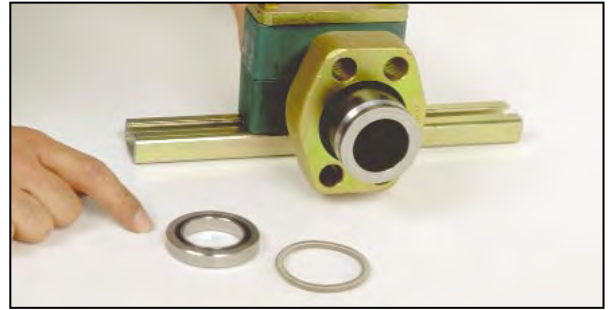
The standard connection styles offered conform to SAE and ISO 4-bolt flanges along with Tube-Mac® Industries 8-bolt/12-bolt proprietary flanges. Other flange patterns may also be available.

TMI[®] Retain Ring Flange Connection Procedure

The retain ring flange connection consists of machined pipe, retain ring flanges, retain rings, 'o' ring seal retainer and bolting hardware.



Step 1: Pipe supplied with butt end machined along with an annular groove on the outside diameter.



Step 2: Slip flange onto the pipe.



Step 3: Retain ring is sprung over the pipe's outside diameter nesting in the annular groove.



Step 4: Select the correct 'o' ring seal retainer style (reference pages C4 -C5). The 'o' ring provides a seal against the butt end of the pipe.



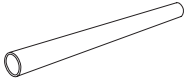
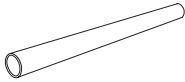
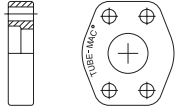
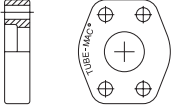
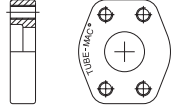
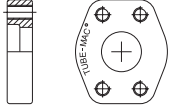
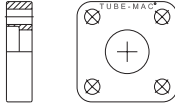
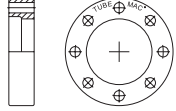


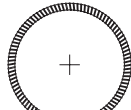
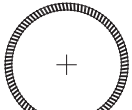


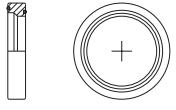
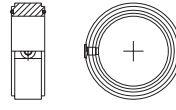
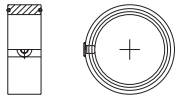
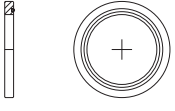
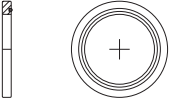
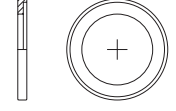
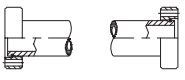
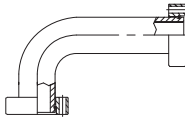
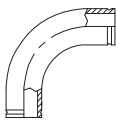
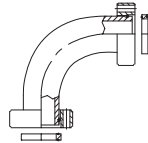
Step 5: Select the required bolting hardware from Section R of this catalogue. Carefully place the 'o' ring seal retainer in between the pipe ends. Slide the flanges forward and the 'o' ring seal retainer becomes captive within the flanges.



Step 6: Tighten bolts to the torque values specified. Always tighten bolts in a cross-over sequence and ensure that the flanges are parallel.



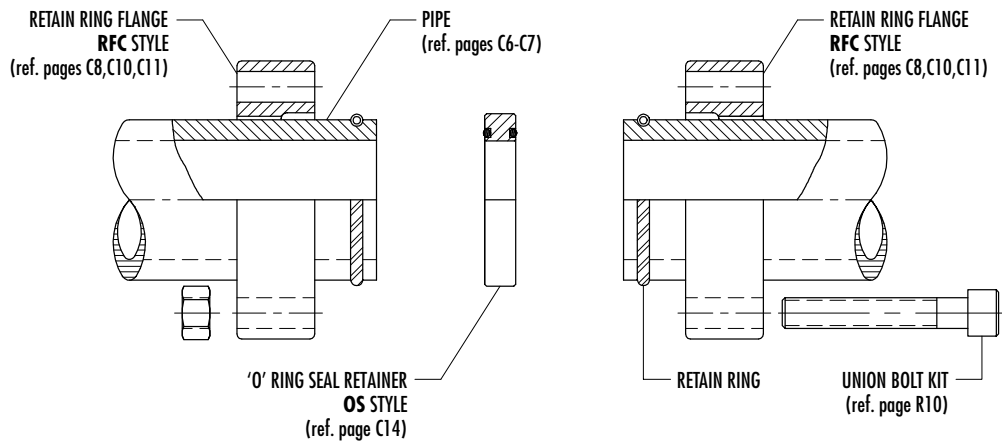
Retain Ring System - Visual Index

<p>PIPES</p>	<p>CARBON STEEL PIPE</p>  <p>1 1/2" - 10" Page C6</p>	<p>STAINLESS STEEL PIPE</p>  <p>4" - 10" Page C7</p>	<p>RETAIN RING FLANGES</p>	<p>RFC34 SAE CODE 61 WITH CLEARANCE HOLES</p>  <p>1 1/2" - 3" Page C8</p>
<p>RFC64 SAE CODE 62 WITH CLEARANCE HOLES</p>  <p>1 1/2" - 2" Page C8</p>	<p>RFT34 SAE CODE 61 WITH UNC TAPPED HOLES</p>  <p>1 1/2" - 3" Page C9</p>	<p>RFT64 SAE CODE 62 WITH UNC TAPPED HOLES</p>  <p>1 1/2" - 2" Page C9</p>	<p>RFC74 ISO 6164 WITH CLEARANCE HOLES</p>  <p>2 1/2" - 4" Page C10</p>	<p>RFAC48/RFAC412 TMI® 8-BOLT/12-BOLT WITH CLEARANCE HOLES</p>  <p>5" - 10" Page C11</p>
<p>RFC49 TMI® 9-BOLT WITH CLEARANCE HOLES</p>  <p>2 1/2" - 4" Page C12</p>	<p>RFAC49 TMI® 9-BOLT WITH CLEARANCE HOLES</p>  <p>5" Page C12</p>	<p>RETAIN RING</p>	<p>R</p>  <p>1 1/2" - 4" Page C13</p>	<p>RA</p>  <p>5" - 10" Page C13</p>
<p>'O' RING SEAL RETAINER</p>	<p>OS</p>  <p>1 1/2" - 4" Page C14</p>	<p>OSA</p>  <p>5" - 10" Page C14</p>	<p>OSS</p>  <p>4" Page C14</p>	<p>OSP</p>  <p>1 1/2" - 4" Page C15</p>
<p>OSAP</p>  <p>5" - 10" Page C15</p>	<p>OSH</p>  <p>1 1/2" - 4" Page C16</p>	<p>OSHS</p>  <p>4" Page C16</p>	<p>'O' RING CONNECTOR PLATE</p>	<p>OCP</p>  <p>1 1/2" - 4" Page C17</p>
<p>PIPE ASSEMBLIES</p>	<p>PAR RETAIN RING FLANGE PIPE ASSEMBLY</p>  <p>1 1/2" - 8" Page C18-19</p>	<p>BPAP RETAIN RING FLANGE BENT PIPE ASSEMBLY</p>  <p>1 1/2" - 8" Page C20-21</p>		
<p>RETAIN RING FLANGE ELBOW</p>	<p>RFE BODY ONLY</p>  <p>1 1/2" - 8" Page C22</p>	<p>A/RFE ASSEMBLY</p>  <p>1 1/2" - 8" Page C23</p>		

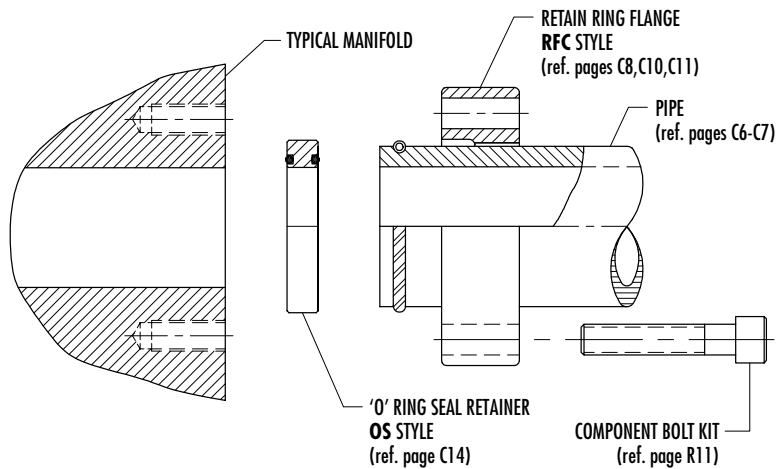


Retain Ring Flange Connections - Heavy Wall Pipe

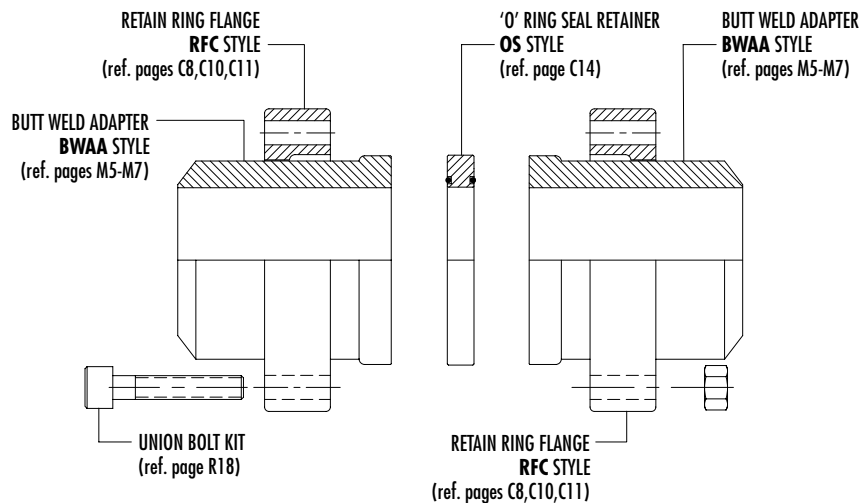
Typical Pipe Union Connection



Typical Pipe to Flat Face Connection



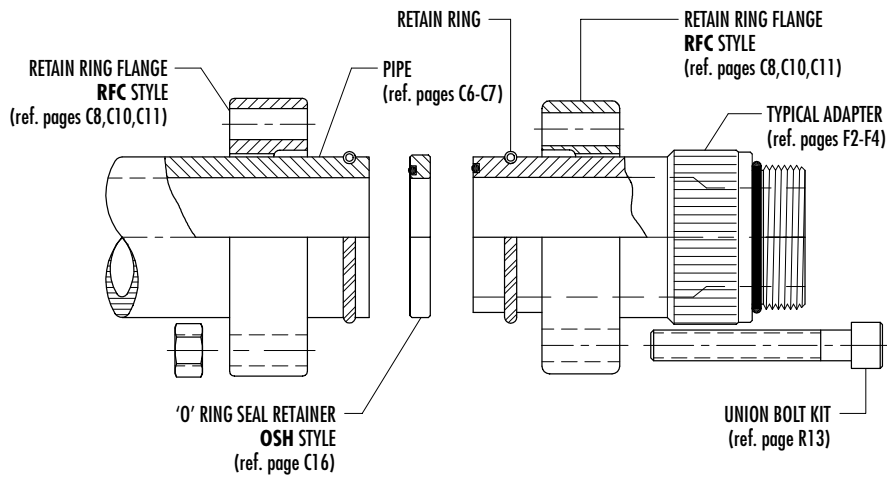
Typical Butt Weld Adapter Union Connection



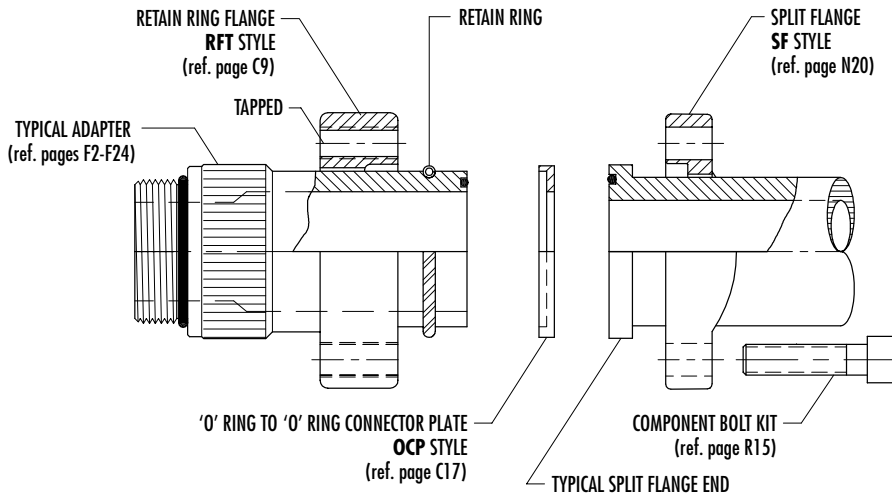


Retain Ring Flange Connections - Heavy Wall Pipe

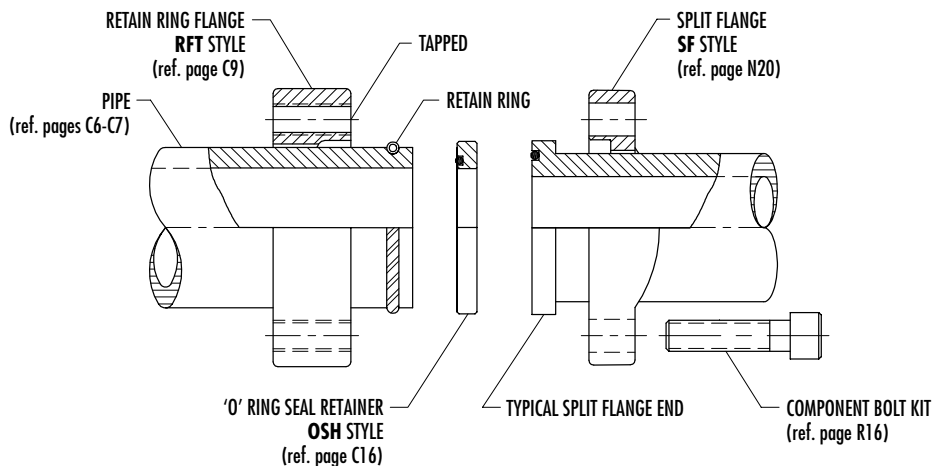
Typical Pipe to 'O' Ring Face Retain Ring Component Connection



Typical 'O' Ring Face Retain Ring Component to SAE Split Flange Connection



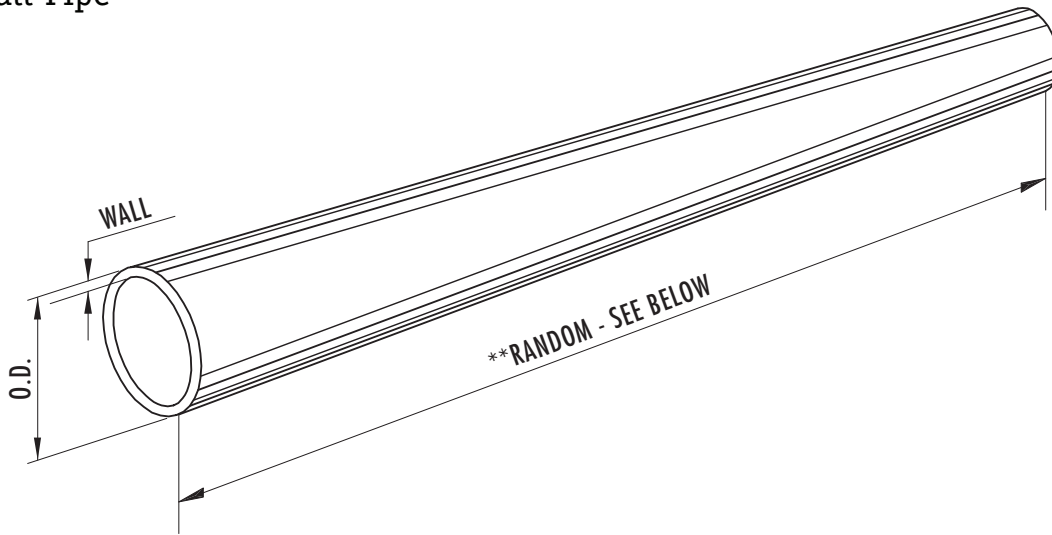
Typical Pipe to SAE Split Flange Connection



TMI[®] Carbon Steel Pipe

Suitable for High Pressure Retain Ring

Heavy Wall Pipe



TMP52CD

A519 - DIN 2391c St 52.4 NBK Ph osphated High Quality Bendable Cold Drawn Seamless Carbon Steel

Nominal Size	Pipe Part No.	OD x Wall (mm)	Bore Dia. (in)	WT. lbs/ft	Working Pressure PSI (bar)
1 1/2"	TMP52CD-56x150x**	56 x 8.5	1.54	6.70	6000 (420)
2"	TMP52CD-66x200x**	66 x 8.5	1.93	8.11	6000 (420)
2 1/2"	TMP52CD-80x250x**	80 x 10	2.36	11.62	5800 (400)
3"	TMP52CD-97x300x**	97 x 12	2.87	16.93	5800 (400)
4"	TMP52CD-115x400x**	115 x 15	3.35	24.90	5800 (400)

**INDICATE LENGTH (inches), AVAILABLE IN RANDOM LENGTHS UP TO 360".

TMP106HR

A106B - Cleaned Seamless Carbon Steel

Schedule XXS/160

Nominal Size	Pipe Part No.	OD x Wall (in)	Bore Dia. (in)	WT. lbs/ft	Working Pressure PSI (bar)
5"	TMP106HR-SCHXXS-500x**	5.563 x 0.750	4.063	38.51	5000 (350)
6"	TMP106HR-SCHXXS-600x**	6.625 x 0.864	4.897	53.10	5000 (350)
8"	TMP106HR-SCH160-800x**	8.625 x 0.906	6.813	74.61	4000 (275)
10"	TMP106HR-SCH160-1000x**	10.750 x 1.125	8.50	115.60	4000 (275)

**INDICATE LENGTH (inches), AVAILABLE IN RANDOM LENGTHS UP TO 480"

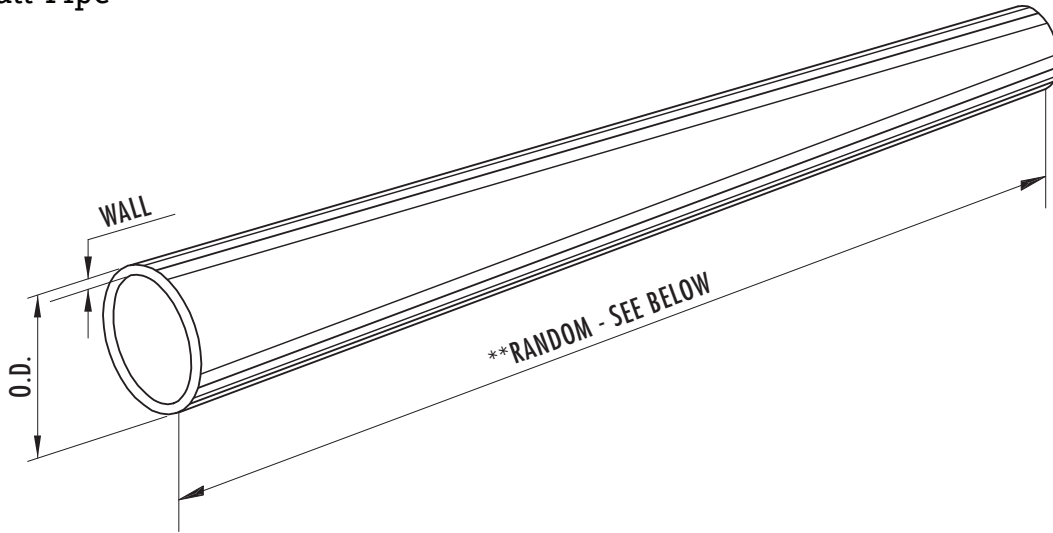
- TO ORDER A RETAIN RING FLANGE PIPE ASSEMBLY REFERENCE PAGE C18-C21
- MAXIMUM ALLOWABLE WORKING PRESSURES ARE BASED ON THE LOWER OF THE PIPE RATING PER ANSI B31.3 OR THE CONNECTION RATING



TMI® Stainless Steel Pipe

Suitable for High Pressure Retain Ring

Heavy Wall Pipe



TMP304SS/316SS

A312 - Seamless Stainless Steel (supplied as dual certification ie. 304/304L or 316/316L)

Schedule XXS/160

Nominal Size	304/304L Stainless Steel Pipe Part No.	316/316L Stainless Steel Pipe Part No.	OD x Wall (in)	Bore Dia. (in)	WT. lbs/ft	Working Pressure PSI (bar)
4"	TMP304SS-SCHXXS-400x**	TMP316SS-SCHXXS-400x**	4.500 x 0.674	3.152	27.54	5800 (400)
5"	TMP304SS-SCHXXS-500x**	TMP316SS-SCHXXS-500x**	5.563 x 0.750	4.063	38.55	5000 (350)
6"	TMP304SS-SCHXXS-600x**	TMP316SS-SCHXXS-600x**	6.625 x 0.864	4.897	53.16	5000 (350)
8"	TMP304SS-SCH160-800x**	TMP316SS-SCH160-800x**	8.625 x 0.906	6.813	74.69	4000 (275)
10"	TMP304SS-SCH160-1000x**	TMP316SS-SCH160-1000x**	10.750 x 1.125	8.50	115.60	4000 (275)

**INDICATE LENGTH (inches), AVAILABLE IN RANDOM LENGTHS UP TO 240"

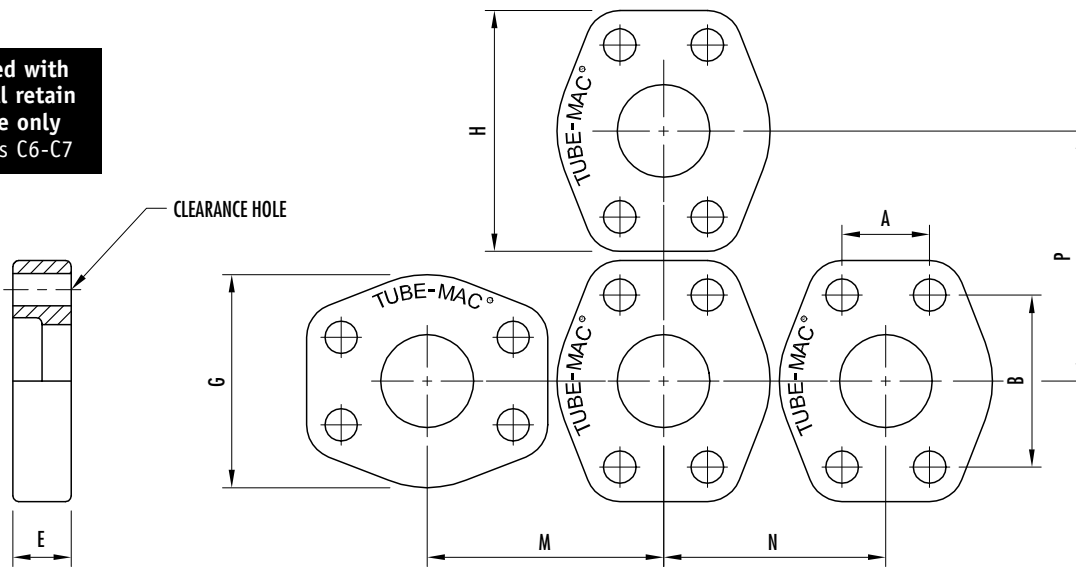
- TO ORDER A RETAIN RING FLANGE PIPE ASSEMBLY REFERENCE PAGE C18-C21
- MAXIMUM ALLOWABLE WORKING PRESSURES ARE BASED ON THE LOWER OF THE PIPE RATING PER ANSI B31.3 OR THE CARBON STEEL CONNECTION RATING
- FOR PIPING SYSTEMS CONSISTING OF ALL STAINLESS STEEL COMPONENTS, PRESSURE RATINGS WILL BE LESS THAN THAT SHOWN ABOVE (CONTACT FACTORY)



Retain Ring Flanges

SAE - Flanges with Clearance Holes

To be used with heavy wall retain ring pipe only
Ref. pages C6-C7



RFC34 Retain Ring Flange - SAE Code 61 With Clearance Holes

Standard Pressure Series 2000-5000 PSI (140-350 bar)

Size	Flange Part No.	Dimensions (in)								Bolt Minimum Grade 5	WT. lbs/pc	Working Pressure PSI (bar)	Bolt Torque ft.lbs.
		A	B	G	H	M	N	P	E				
1/2"	RFC34-050	0.69	1.50	1.81	2.16	2.20	2.09	2.32	0.81	5/16" UNC	0.40	5000 (350)	15-18
3/4"	RFC34-075	0.88	1.88	2.06	2.56	2.40	2.17	2.68	0.82	3/8" UNC	0.46	5000 (350)	20-30
1"	RFC34-100	1.03	2.06	2.31	2.76	2.64	2.44	2.87	0.87	3/8" UNC	0.58	5000 (350)	20-30
1 1/4"	RFC34-125	1.19	2.31	2.88	3.11	3.11	2.99	3.23	0.91	7/16" UNC	0.79	4000 (275)	40-50
1 1/2"	RFC34-150	1.41	2.75	3.25	3.66	3.58	3.35	3.78	1.06	1/2" UNC	1.41	3000 (210)	80-90
2"	RFC34-200	1.69	3.06	3.81	4.02	4.02	3.94	4.13	1.22	1/2" UNC	2.01	3000 (210)	80-90
2 1/2"	RFC34-250	2.00	3.50	4.28	4.49	4.49	4.37	4.61	1.40	1/2" UNC	3.28	2500 (175)	80-90
3"	RFC34-300	2.44	4.19	5.16	5.28	5.35	5.24	5.39	1.67	5/8" UNC	5.14	2000 (140)	110-120

RFC64 Retain Ring Flange - SAE Code 62 With Clearance Holes

High Pressure Series 6000 PSI (420 bar)

Size	Flange Part No.	Dimensions (in)								Bolt Minimum Grade 5	WT. lbs/pc	Working Pressure PSI (bar)	Bolt Torque ft.lbs.
		A	B	G	H	M	N	P	E				
1/2"	RFC64-050	0.72	1.59	1.88	2.22	2.20	2.09	2.32	0.81	5/16" UNC	0.43	6000 (420)	15-18
3/4"	RFC64-075	0.94	2.00	2.38	2.81	2.76	2.68	2.95	1.02	3/8" UNC	0.83	6000 (420)	20-30
1"	RFC64-100	1.09	2.25	2.75	3.19	3.19	2.99	3.35	1.03	7/16" UNC	1.16	6000 (420)	40-50
1 1/4"	RFC64-125	1.25	2.63	3.06	3.75	3.58	3.27	3.90	1.25	1/2" UNC	1.86	6000 (420)	80-90
1 1/2"	RFC64-150	1.44	3.13	3.75	4.44	4.25	3.98	4.57	1.38	5/8" UNC	3.14	6000 (420)	110-120
2"	RFC64-200	1.75	3.81	4.50	5.25	5.04	4.72	5.39	1.68	3/4" UNC	4.82	6000 (420)	120-130

• FOR BOLT KITS - REFERENCE SECTION R

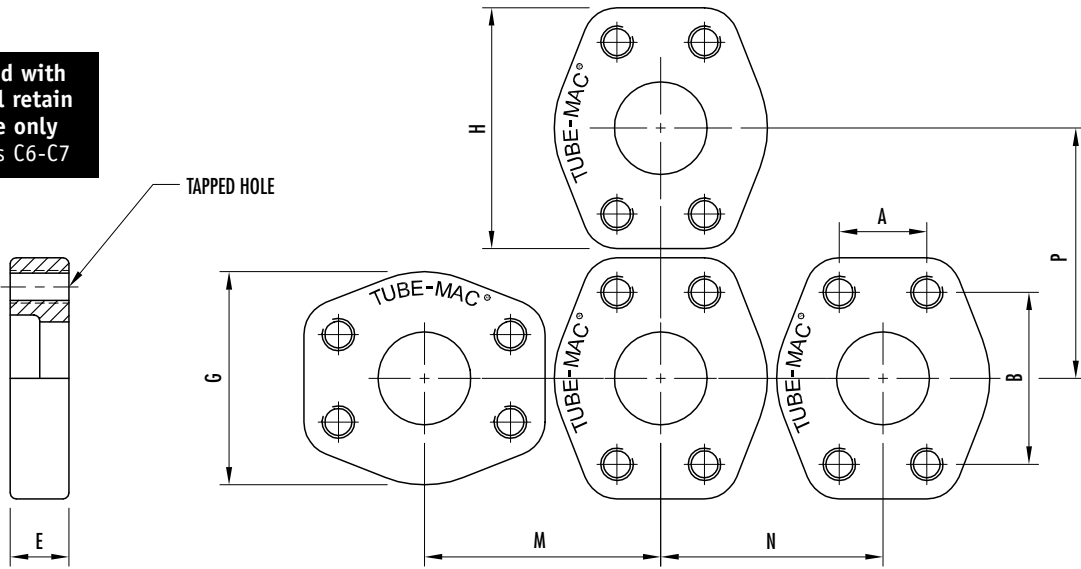
MATERIAL: FORGED CARBON STEEL, YELLOW ZINC DICHROMATE PLATED, (STAINLESS STEEL AVAILABLE)



Retain Ring Flanges

SAE - Flanges with Tapped Holes

To be used with heavy wall retain ring pipe only
Ref. pages C6-C7



RFT34 Retain Ring Flange - SAE Code 61 With Tapped Holes

Standard Pressure Series 2000-5000 PSI (140-350 bar)

Size	Flange Part No.	Dimensions (in)								Tap UNC-2B	WT. lbs/pc	Working Pressure PSI (bar)	Bolt Torque ft.lbs.
		A	B	G	H	M	N	P	E				
1/2"	RFT34-050	0.69	1.50	1.81	2.16	2.20	2.09	2.32	0.81	5/16"-18	0.44	5000 (350)	15-18
3/4"	RFT34-075	0.88	1.88	2.06	2.56	2.40	2.17	2.68	0.82	3/8"-16	0.62	5000 (350)	20-30
1"	RFT34-100	1.03	2.06	2.31	2.76	2.64	2.44	2.87	0.87	3/8"-16	0.75	5000 (350)	20-30
1 1/4"	RFT34-125	1.19	2.31	2.88	3.11	3.11	2.99	3.23	0.91	7/16"-14	1.15	4000 (275)	40-50
1 1/2"	RFT34-150	1.41	2.75	3.25	3.66	3.58	3.35	3.78	1.06	1/2"-13	2.15	3000 (210)	80-90
2"	RFT34-200	1.69	3.06	3.81	4.02	4.02	3.94	4.13	1.22	1/2"-13	2.65	3000 (210)	80-90
2 1/2"	RFT34-250	2.00	3.50	4.28	4.49	4.49	4.37	4.61	1.40	1/2"-13	3.75	2500 (175)	80-90
3"	RFT34-300	2.44	4.19	5.16	5.28	5.35	5.24	5.39	1.67	5/8"-11	6.10	2000 (140)	110-120

RFT64 Retain Ring Flange - SAE Code 62 With Tapped Holes

High Pressure Series 6000 PSI (420 bar)

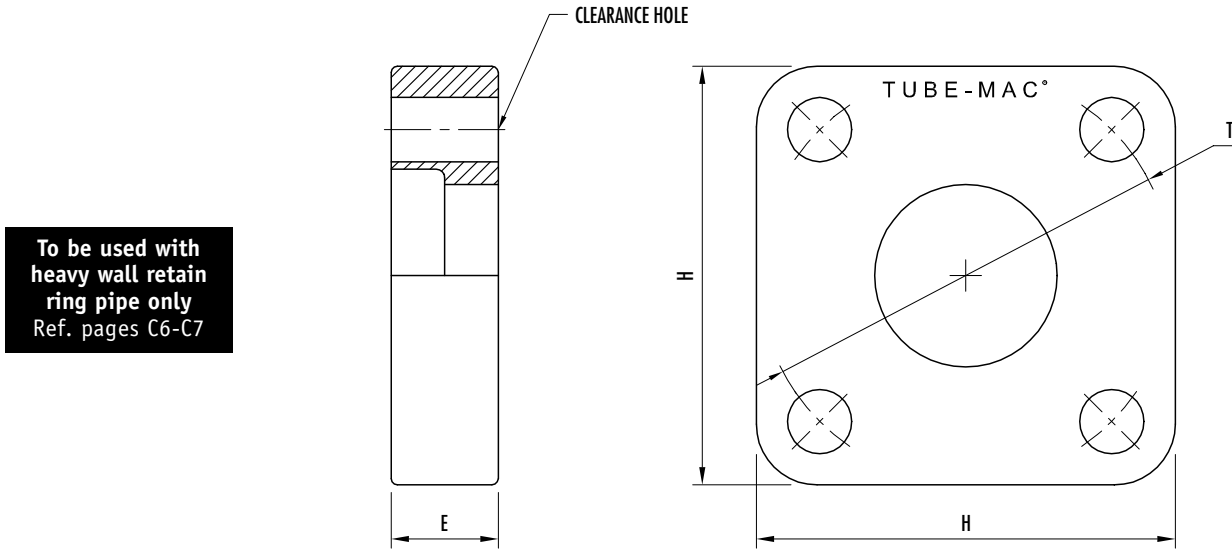
Size	Flange Part No.	Dimensions (in)								Tap UNC-2B	WT. lbs/pc	Working Pressure PSI (bar)	Bolt Torque ft.lbs.
		A	B	G	H	M	N	P	E				
1/2"	RFT64-050	0.72	1.59	1.88	2.22	2.20	2.09	2.32	0.81	5/16"-18	0.52	6000 (420)	15-18
3/4"	RFT64-075	0.94	2.00	2.38	2.81	2.76	2.68	2.95	1.02	3/8"-16	0.79	6000 (420)	20-30
1"	RFT64-100	1.09	2.25	2.75	3.19	3.19	2.99	3.35	1.03	7/16"-14	0.88	6000 (420)	40-50
1 1/4"	RFT64-125	1.25	2.63	3.06	3.75	3.58	3.27	3.90	1.25	1/2"-13	2.18	6000 (420)	80-90
1 1/2"	RFT64-150	1.44	3.13	3.75	4.44	4.25	3.98	4.57	1.38	5/8"-11	3.16	6000 (420)	110-120
2"	RFT64-200	1.75	3.81	4.50	5.25	5.04	4.72	5.39	1.68	3/4"-10	5.10	6000 (420)	120-130

MATERIAL: FORGED CARBON STEEL, YELLOW ZINC DICHROMATE PLATED, (STAINLESS STEEL AVAILABLE)



Retain Ring Flanges

ISO 6164 - Flanges with Clearance Holes



To be used with heavy wall retain ring pipe only
Ref. pages C6-C7

RFC74 Retain Ring Flange - ISO 6164 With Clearance Holes

5800 PSI (400 bar)

Size	Flange Part No.	Dimensions (in)			Bolt Minimum Grade 5	WT. lbs/pc	Working Pressure PSI (bar)	Bolt Torque ft.lbs.
		T	H	E				
2 1/2"	RFC74-250	4.65	4.72	1.48	3/4" UNC	4.79	5800 (400)	120-130
3"	RFC74-300	5.71	5.91	1.73	1" UNC	7.88	5800 (400)	350-400
4"	RFC74-400	6.89	7.00	1.98	1 1/8" UNC	14.41	5800 (400)	500-550

• FOR BOLT KITS - REFERENCE SECTION R

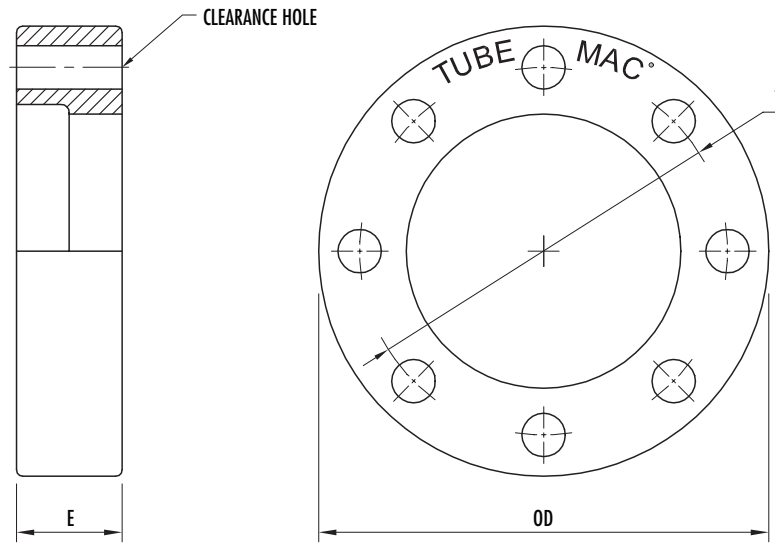
MATERIAL: CARBON STEEL, YELLOW ZINC DICHROMATE PLATED, (STAINLESS STEEL AVAILABLE)



Retain Ring Flanges

TMI® 8-Bolt/12-Bolt - Flanges with Clearance Holes

To be used with heavy wall retain ring pipe only
Ref. pages C6-C7



RFAC48 Retain Ring Flange - TMI® 8-Bolt With Clearance Holes

5000 PSI (350 bar)

Size	Flange Part No.	Dimensions (in)			Bolt/Stud	WT. lbs/pc	Working Pressure PSI (bar)	Bolt Torque ft.lbs.
		T	OD	E				
5"	RFAC48-500	7.88	9.65	2.00	1" UNC	20.85	5000 (350)	350-400
6"	RFAC48-600	9.65	11.81	2.31	1 1/8" B7 stud	44.25	5000 (350)	500-550
8"	RFAC48-800	12.40	15.13	3.00	1 1/2" B7 stud	87.06	5000 (350)	1100-1200

• FOR BOLT KITS - REFERENCE SECTION R

MATERIAL: CARBON STEEL, YELLOW ZINC DICHROMATE PLATED, (STAINLESS STEEL AVAILABLE)

RFAC412 Retain Ring Flange - TMI® 12-Bolt With Clearance Holes

4000 PSI (275 bar)

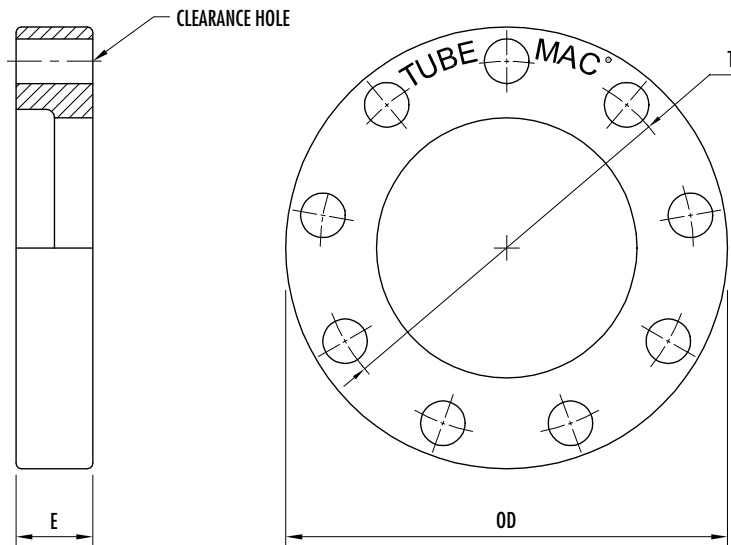
Size	Flange Part No.	Dimensions (in)			Bolt/Stud	WT. lbs/pc	Working Pressure PSI (bar)	Bolt Torque ft.lbs.
		T	OD	E				
10"	RFAC412-1000	14.76	17.75	3.80	1 1/2" B7 stud	127.60	4000 (275)	1100-1200



Retain Ring Flanges

TMI® 9-Bolt - Flanges with Clearance Holes

To be used with heavy wall retain ring pipe only
Ref. pages C6-C7



RFC49 Retain Ring Flange - TMI® 9-Bolt With Clearance Holes

For use with Retain Ring Connection to 9-Bolt Ball Valve BBVG27 (reference page P10)
4000-4200 PSI (275-290 bar)

Size	Flange Part No.	Dimensions (in)			Bolt Minimum Grade 5	WT. lbs/pc	Working Pressure PSI (bar)	Bolt Torque ft.lbs.
		T	OD	E				
2 1/2"	RFC49-250	4.03	4.95	1.48	1/2" UNC	2.65	4200 (290)	80-90
3"	RFC49-300	5.49	6.50	1.73	5/8" UNC	5.77	4100 (280)	110-120
4"	RFC49-400	6.14	7.38	1.98	5/8" UNC	7.97	4000 (275)	110-120

RFAC49 Retain Ring Flange - TMI® 9-Bolt With Clearance Holes

For use with Retain Ring Connection to 9-Bolt Ball Valve BBVG27 (reference page P10)
3860 PSI (265 bar)

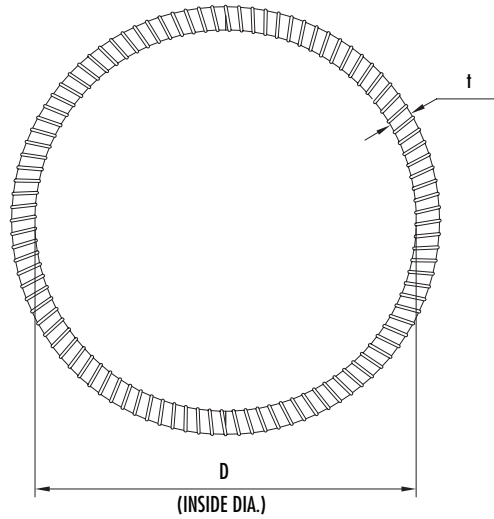
Size	Flange Part No.	Dimensions (in)			Bolt Minimum Grade 5	WT. lbs/pc	Working Pressure PSI (bar)	Bolt Torque ft.lbs.
		T	OD	E				
5"	RFAC49-500	7.56	9.00	2.00	3/4" UNC	22.37	3860 (265)	120-130

• FOR BOLT KITS - REFERENCE SECTION R

MATERIAL: CARBON STEEL, YELLOW ZINC DICHROMATE PLATED, (STAINLESS STEEL AVAILABLE)



Retain Ring



R Retain Ring - 1/2" - 4"

RA Retain Ring - 5" - 10"

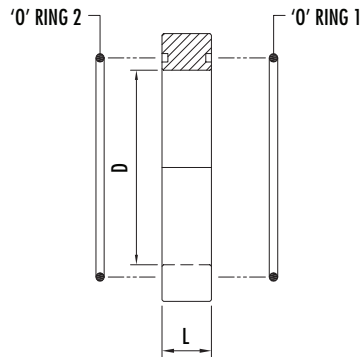
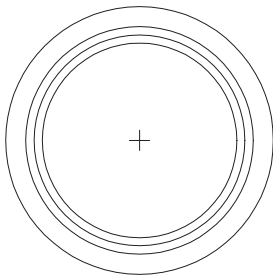
Size	Retain Ring Part No.	Dimensions (in)		WT. lbs/pc
		D	t	
1/2"	R-050	0.85	0.16	0.01
3/4"	R-075	1.24	0.16	0.02
1"	R-100	1.32	0.20	0.03
1 1/4"	R-125	1.59	0.20	0.04
1 1/2"	R-150	1.99	0.20	0.05
2"	R-200	2.38	0.20	0.06
2 1/2"	R-250	2.93	0.20	0.07
3"	R-300	3.56	0.24	0.12
4"	R-400	4.19	0.31	0.27
5"	RA-500	5.23	0.31	0.34
6"	RA-600	6.21	0.39	0.64
8"	RA-800	8.13	0.47	1.18
10"	RA-1000	10.26	0.47	2.41

MATERIAL: STAINLESS STEEL - AISI 302/304 SPRING TEMPER

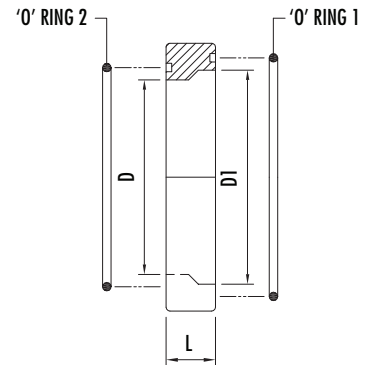


'O' Ring Seal Retainer

OS/OSA



OSS (4" only)



OS 'O' Ring Seal Retainer for Retain Ring Pipe - 1/2"- 4"

Complete with Buna 'O' Rings (Standard)

OSA 'O' Ring Seal Retainer for Retain Ring Pipe - 5"-10"

Complete with Buna 'O' Rings (Standard)

Size	Retainer Part No.	Dimensions (in)		'O' Rings 1&2 (Buna) Part No.	WT. lbs/pc
		D	L		
1/2"	OS-050-*	0.55	0.50	OR*-3-909	0.08
3/4"	OS-075-*	0.79	0.50	OR*-3-913	0.13
1"	OS-100-*	0.91	0.50	OR*-3-916	0.15
1 1/4"	OS-125-*	1.18	0.50	OR*-3-918	0.19
1 1/2"	OS-150-*	1.54	0.50	OR*-3-924	0.24
2"	OS-200-*	1.93	0.50	OR*-3-928	0.29
2 1/2"	OS-250-*	2.36	1.00	OR*-2-232	0.53
3"	OS-300-*	2.88	1.00	OR*-2-237	0.78
4"	OS-400-*	3.35	1.00	OR*-2-241	1.22
5"	OSA-500-*	4.06	1.50	OR*-2-353	5.73
6"	OSA-600-*	4.90	1.50	OR*-2-359	6.80
8"	OSA-800-*	6.81	1.50	OR*-2-368	10.34
10"	OSA-1000-*	8.50	2.00	OR*-2-377	21.60

* INSERT ' V ' TO INDICATE OPTIONAL VITON 'O' RINGS

◆ CANNOT BE USED FOR CONNECTION TO STAUFF BALL VALVE (BBVG27), REFERENCE OSS-400 (SEE BELOW)

OSS 'O' Ring Seal Retainer for Retain Ring Pipe - 4"

For use with Retain Ring Connection to 9-Bolt Ball Valve BBVG27 (reference page p10)

Complete with Buna 'O' Rings (Standard)

Size	Retainer Part No.	Dimensions (in)			'O' Ring 1 (Buna) Part No.	'O' Ring 2 (Buna) Part No.	WT. lbs/pc
		D	D1	L			
4"	OSS-400-*	3.35	3.80	1.00	OR*-2-243	OR*-2-241	1.22

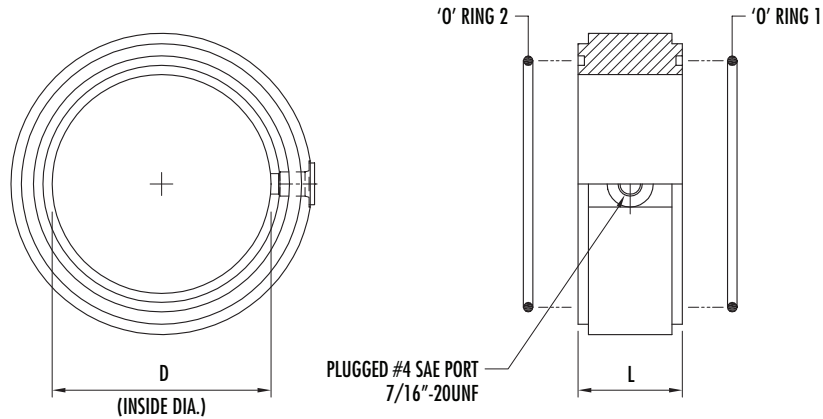
* INSERT ' V ' TO INDICATE OPTIONAL VITON 'O' RINGS

MATERIAL: CARBON STEEL, YELLOW ZINC DICHROMATE PLATED, (STAINLESS STEEL AVAILABLE)



'O' Ring Seal Retainer

With Pilot Port



OSP 'O' Ring Seal Retainer with Pilot Port for Retain Ring Pipe - 1/2"-4"
Complete with Buna 'O' Rings (Standard) and #4 SAE Port (Plugged)

OSAP 'O' Ring Seal Retainer with Pilot Port for Retain Ring Pipe - 5"-10"
Complete with Buna 'O' Rings (Standard) and #4 SAE Port (Plugged)

Size	Retainer Part No.	Dimensions (in)		'O' Rings 1&2 (Buna) Part No.	WT. lbs/pc
		D	L		
1/2"	OSP-050-*	0.55	1.50	OR*-3-909	0.41
3/4"	OSP-075-*	0.79	1.50	OR*-3-913	0.65
1"	OSP-100-*	0.91	1.50	OR*-3-916	0.82
1 1/4"	OSP-125-*	1.18	1.50	OR*-3-918	0.94
1 1/2"	OSP-150-*	1.54	1.50	OR*-3-924	1.25
2"	OSP-200-*	1.93	1.50	OR*-3-928	1.53
2 1/2"	OSP-250-*	2.36	1.50	OR*-2-232	1.98
3"	OSP-300-*	2.88	1.50	OR*-2-237	2.80
◆4"	OSP-400-*	3.35	1.50	OR*-2-241	6.21
5"	OSAP-500-*	4.06	1.50	OR*-2-353	8.76
6"	OSAP-600-*	4.90	1.50	OR*-2-359	12.62
8"	OSAP-800-*	6.81	1.50	OR*-2-368	19.70
10"	OSAP-1000-*	8.50	2.00	OR*-2-377	21.60

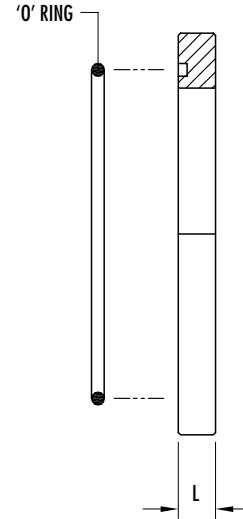
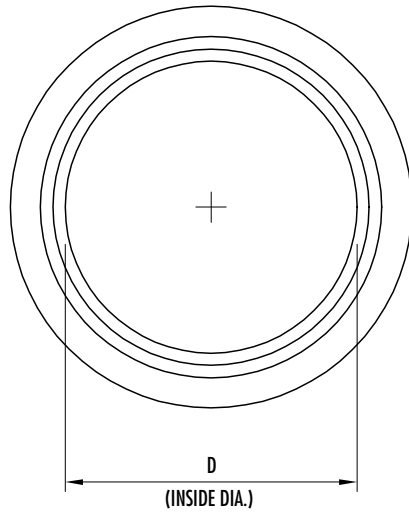
* INSERT ' V ' TO INDICATE OPTIONAL VITON 'O' RINGS

◆ CANNOT BE USED FOR CONNECTION TO STAUFF BALL VALVE (BBVG27), REFERENCE OSS-400 (REFERENCE PREVIOUS PAGE, C14)

MATERIAL: CARBON STEEL, YELLOW ZINC DICHROMATE PLATED, (STAINLESS STEEL AVAILABLE)



'O' Ring Seal Retainer



OSH 'O' Ring Seal Retainer for Retain Ring Pipe

Complete with Buna 'O' Ring (Standard)

Size	Retainer Part No.	Dimensions (in)		'O' Ring (Buna) Part No.	WT. lbs/pc
		D	L		
1/2"	OSH-050-*	0.55	0.25	OR*-3-909	0.04
3/4"	OSH-075-*	0.79	0.25	OR*-3-913	0.07
1"	OSH-100-*	0.91	0.25	OR*-3-916	0.08
1 1/4"	OSH-125-*	1.18	0.25	OR*-3-918	0.09
1 1/2"	OSH-150-*	1.54	0.25	OR*-3-924	0.12
2"	OSH-200-*	1.93	0.25	OR*-3-928	0.15
2 1/2"	OSH-250-*	2.36	0.50	OR*-2-232	0.26
3"	OSH-300-*	2.88	0.50	OR*-2-237	0.39
4"	OSH-400-*	3.35	0.50	OR*-2-241	0.60

* INSERT ' V ' TO INDICATE OPTIONAL VITON 'O' RING

♦ CANNOT BE USED FOR CONNECTION TO STAUFF BALL VALVE (BBVG27), REFERENCE OSHS-400 (SEE BELOW)

MATERIAL: CARBON STEEL, YELLOW ZINC DICHROMATE PLATED, (STAINLESS STEEL AVAILABLE)

OSHS 'O' Ring Seal Retainer for Retain Ring Component - 4"

For use with Retain Ring Component Connection to 9-Bolt Ball Valve BBVG27 (reference page P10)

Complete with Buna 'O' Ring (Standard)

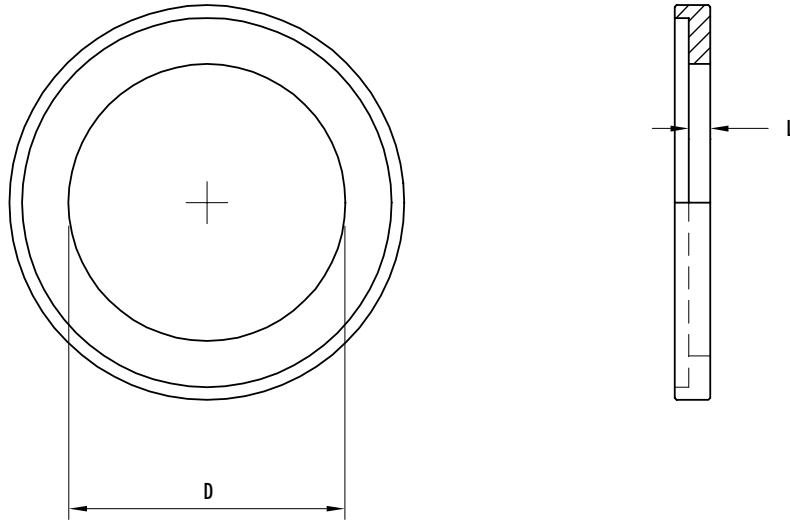
Size	Retainer Part No.	Dimensions (in)		'O' Ring (Buna) Part No.	WT. lbs/pc
		D	L		
4"	OSHS-400-*	3.80	0.50	OR*-2-243	0.60

* INSERT ' V ' TO INDICATE OPTIONAL VITON 'O' RINGS

MATERIAL: CARBON STEEL, YELLOW ZINC DICHROMATE PLATED, (STAINLESS STEEL AVAILABLE)



'O' Ring Connector Plate



OCP 'O' Ring Connector Plate for Retain Ring Components

Size	Retainer Part No.	Dimensions (in)		WT. lbs/pc
		D	L	
1/2"	OCP-050	0.50	0.13	0.04
3/4"	OCP-075	0.75	0.13	0.06
1"	OCP-100	0.94	0.13	0.07
1 1/4"	OCP-125	1.20	0.13	0.08
1 1/2"	OCP-150	1.50	0.13	0.11
2"	OCP-200	1.94	0.13	0.13
2 1/2"	OCP-250	2.36	0.13	0.17
3"	OCP-300	2.88	0.13	0.25
4"	OCP-400	3.35	0.13	0.34

MATERIAL: CARBON STEEL, YELLOW ZINC DICHROMATE PLATED, (STAINLESS STEEL AVAILABLE)



Retain Ring Flange Pipe Assembly

Heavy Wall Pipe

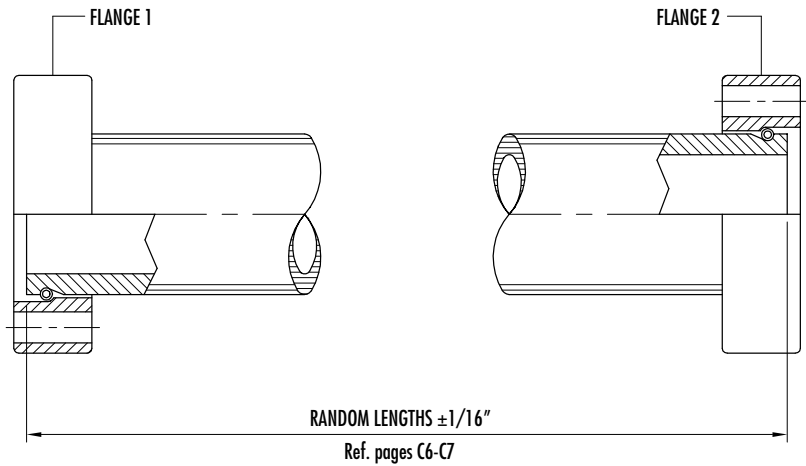
Typical PAR Assembly

COMPLETE ASSEMBLY CONSISTS OF:

- ONE (1) LENGTH OF CLEAN PIPE (REF. PAGES C6-C7)
- TWO (2) RETAIN RING FLANGES (REF. PAGES C8-C12)
- TWO (2) RETAIN RINGS
- ENDS SEALED WITH 6 MIL HEAT SHRINK MATERIAL (1 1/2" - 3")
- ENDS SEALED WITH POSITIVE CLOSURE (4" - 8")

TO BE ORDERED SEPARATELY:

- 'O' RING SEAL RETAINER(S) (REF. PAGES C14-C16)



PART NO. (EXAMPLE): PAR/56 x 8.5 - FC34 - FC34 - 360



Retain Ring Flange Pipe Assembly

Complete Assembly Part Number

Code		PAR	Pipe Material	Pipe Size & Wall/Schedule	Flange 1	Flange 2	Length	Options
Pipe Assembly - Retain Ring		PAR						
Pipe Material Carbon Steel (Standard)	No Designation Required							
Pipe Material ♦Stainless Steel (Optional) Ref. page (C7)	TMP304SS	304						
	TMP316SS	316						
Pipe Size & Wall Ref. page (C6) Phosphated Cold Drawn Seamless Carbon Steel A519-DIN 2391c St. 52.4 NBK	1 1/2"	56x8.5						
	2"	66x8.5						
	2 1/2"	80x10						
	3"	97x12						
	4"	115x15						
Pipe Size & Schedule Ref. page (C6) Cleaned Seamless Carbon Steel A106B	5"	SCHXXS-500						
	6"	SCHXXS-600						
	8"	SCH160-800						
Flange Type Carbon Steel Yellow Zinc Dicromate Plated Ref. pages (C8-C12)	RFC34 SAE Code 61 W/Clearance Holes	FC34						
	*RFT34 SAE Code 61 W/Tapped Holes	FT34						
	RFC64 SAE Code 62 W/Clearance Holes	FC64						
	*RFT64 SAE Code 62 W/Tapped Holes	FT64						
	RFC74 ISO 6164 W/Clearance Holes	FC74						
	RFAC48 TMI® 8-Bolt W/Clearance Holes	FAC48						
	**RFC49 TMI® 9-Bolt W/Clearance Holes	FC49						
	**RFAC49 TMI® 9-Bolt W/Clearance Holes	FAC49						
Length	Specify (in.)							
Options	Painted (Specify)	P						
♦ Complete Stainless Steel Assembly: (including flanges)								SS

'O' Ring seal retainers are to be ordered separately (reference pages C14-C16)

- ♦ STAINLESS STEEL IS AVAILABLE (CONSULT FACTORY)
- ** FOR USE WITH 9-BOLT BALL VALVE CONNECTIONS (REFERENCE PAGE P10)
- * NORMALLY USED FOR CONNECTION TO SPLIT FLANGE TYPE ENDS

PART NO. (EXAMPLE): PAR/56 x 8.5 - FC34 - FC34 - 360

- ASSEMBLY WORKING PRESSURE RATINGS ARE SUBJECT TO THE LESSER OF THE FLANGE OR PIPE RATINGS
- SEE REFERENCE PAGES INDICATED ABOVE FOR PRESSURE RATINGS
- FOR BOLT KITS - REFERENCE SECTION R



Retain Ring Flange Bent Pipe Assembly

Heavy Wall Pipe

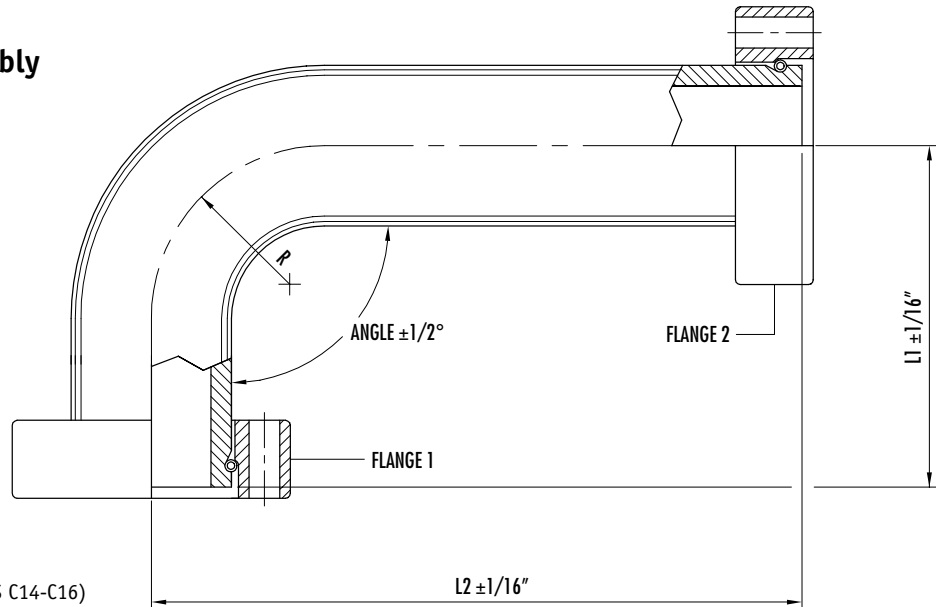
Typical BPAR Assembly

COMPLETE ASSEMBLY CONSISTS OF:

- ONE (1) LENGTH OF BENT CLEAN PIPE (REF. PAGES C6-C7)
- TWO (2) RETAIN RING FLANGES (REF. PAGES C8-C12)
- TWO (2) RETAIN RINGS
- ENDS SEALED WITH 6 MIL HEAT SHRINK MATERIAL (1 1/2" - 3")
- ENDS SEALED WITH POSITIVE CLOSURE (4" - 8")

TO BE ORDERED SEPARATELY:

- 'O' RING SEAL RETAINER(S) (REF. PAGES C14-C16)



PART NO. (EXAMPLE): BPAR/56 x 8.5 - FC34 - FC34 - 230 - 90 - 130

Size	Dimensions (in)	
	L(min)	R
1 1/2"	12.50	8.25
2"	14.00	9.50
2 1/2"	17.00	12.50
3"	20.00	15.00
4"	25.00	20.00
5"	25.00	20.00
6"	30.00	24.00
8"	40.00	32.00



Retain Ring Flange Bent Pipe Assembly

Complete Assembly Part Number

Code		BP	AR	/	Pipe Material	-	Pipe Size & Wall/Schedule	-	Flange 1	-	Flange 2	-	Length L1	-	Angle	-	Length L2	-	Options	
Bent Pipe Assembly - Retain Ring		BP																		
Pipe Material Carbon Steel (Standard)	No Designation Required																			
Pipe Material ♦Stainless Steel (Optional) Ref. page (C7)	TMP304SS	304																		
	TMP316SS	316																		
Pipe Size & Wall Ref. page (C6) Phosphated Cold Drawn Seamless Carbon Steel A519-DIN 2391c St. 52.4 NBK	1 1/2"	56x8.5																		
	2"	66x8.5																		
	2 1/2"	80x10																		
	3"	97x12																		
Pipe Size & Schedule Ref. page (C6) Cleaned Seamless Carbon Steel A106B	4"	115x15																		
	5"	SCHXXS-500																		
	6"	SCHXXS-600																		
Flange Type Carbon Steel Yellow Zinc Dicromate Plated Ref. pages (C8-C12)	RFC34 SAE Code 61 W/Clearance Holes	FC34																		
	*RFT34 SAE Code 61 W/Tapped Holes	FT34																		
	RFC64 SAE Code 62 W/Clearance Holes	FC64																		
	*RFT64 SAE Code 62 W/Tapped Holes	FT64																		
	RFC74 ISO 6164 W/Clearance Holes	FC74																		
	RFAC48 TMI® 8-Bolt W/Clearance Holes	FAC48																		
	**RFC49 TMI® 9-Bolt W/Clearance Holes	FC49																		
	**RFAC49 TMI® 9-Bolt W/Clearance Holes	FAC49																		
Length	L1	Specify (in.)																		
Angle	Max. 90°	Specify (°)																		
Length	L2	Specify (in.)																		
Options	Painted (Specify)	P																		
♦ Complete Stainless Steel Assembly: (including flanges)		SS																		

'O' Ring seal retainers are to be ordered separately (reference pages C14-C16)

♦ STAINLESS STEEL IS AVAILABLE (CONSULT FACTORY)

**FOR USE WITH 9-BOLT BALL VALVE CONNECTIONS (REFERENCE PAGE P10)

* NORMALLY USED FOR CONNECTION TO SPLIT FLANGE TYPE ENDS

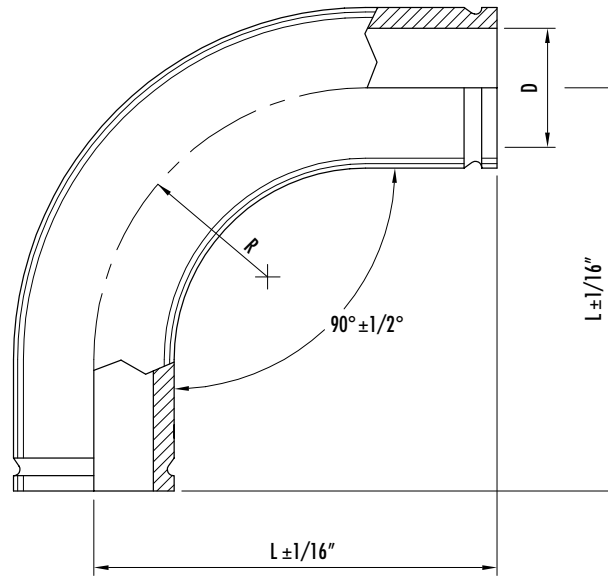
PART NO. (EXAMPLE): BPAR/56 x 8.5 - FC34 - FC34 - 230 - 90 - 130

- ASSEMBLY WORKING PRESSURE RATINGS ARE SUBJECT TO THE LESSER OF THE FLANGE OR PIPE RATINGS
- SEE REFERENCE PAGES INDICATED ABOVE FOR PRESSURE RATINGS
- FOR BOLT KITS - REFERENCE SECTION R



Retain Ring Flange Elbow

Long Radius Bent Elbow - Body Only



RFE Retain Ring Flange Elbow - Body Only

Size	Body Only Part No.	Dimensions (in)			WT. (Body Only) lbs/pc	Working Pressure (Body Only) PSI (bar)
		L	R	D		
1 1/2"	RFE-150	12.50	8.25	1.54	11.50	6000 (420)
2"	RFE-200	14.00	9.50	1.93	15.59	6000 (420)
2 1/2"	RFE-250	17.00	12.50	2.36	26.67	5800 (400)
3"	RFE-300	20.00	15.00	2.88	45.80	5800 (400)
4"	RFE-400	25.00	20.00	3.35	83.51	5800 (400)
5"	RFE-500	25.00	20.00	4.06	121.49	4000 (275)
6"	RFE-600	30.00	24.00	4.90	206.32	3700 (255)
8"	RFE-800	40.00	32.00	6.81	391.35	3500 (240)

- OTHER RADII AVAILABLE (CONSULT FACTORY)
- TO ORDER COMPLETE ASSEMBLY REFERENCE PAGE C23

MATERIAL: CARBON STEEL, (STAINLESS STEEL AVAILABLE - CONSULT FACTORY)



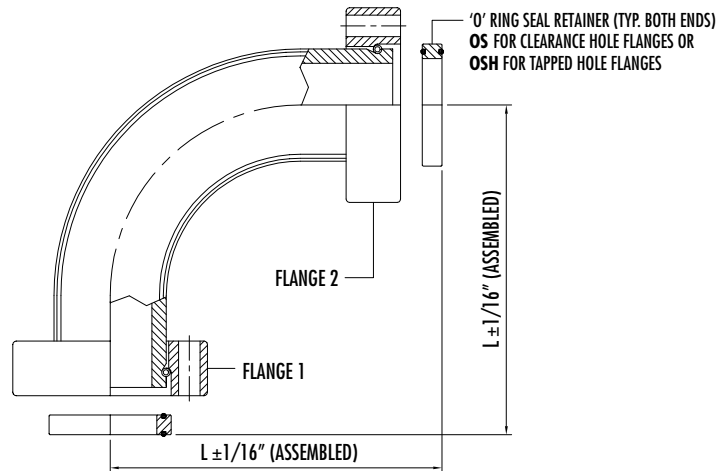
Retain Ring Flange Elbow Assembly

Complete Assembly Part Number

Typical A/RFE Assembly

COMPLETE ASSEMBLY CONSISTS OF:

- ONE (1) RETAIN RING FLANGE ELBOW BODY (REF. PAGE C22)
- TWO (2) RETAIN RING FLANGES (REF. PAGES C8-C12)
- TWO (2) RETAIN RINGS
- TWO (2) 'O' RING SEAL RETAINERS (REF. PAGES C14-C16)
- ENDS SEALED WITH 6 MIL HEAT SHRINK MATERIAL (1 1/2" - 3")
- ENDS SEALED WITH POSITIVE CLOSURE (4" - 8")



Code		A	/	RFE	-	Body Material	-	Size	-	Flange 1	-	Flange 2	-	Options
Assembly		A												
Retain Ring Flange Elbow		RFE												
Body Material Carbon Steel (Standard)	No Designation Required													
Body Material Stainless Steel (Optional) Ref. page (C7)	TMP304SS	304												
	TMP316SS	316												
Body Size	1 1/2"	150												
	2"	200												
	2 1/2"	250												
	3"	300												
	4"	400												
	5"	500												
	6"	600												
	8"	800												
Flange Type Carbon Steel Yellow Zinc Dicromate Plated Ref. pages (C8-C12)	RFC34 SAE Code 61 W/Clearance Holes	FC34												
	*RFT34 SAE Code 61 W/Tapped Holes	FT34												
	RFC64 SAE Code 62 W/Clearance Holes	FC64												
	*RFT64 SAE Code 62 W/Tapped Holes	FT64												
	RFC74 ISO 6164 W/Clearance Holes	FC74												
	RFAC48 TMI® 8-Bolt W/Clearance Holes	FAC48												
	**RFC49 TMI® 9-Bolt W/Clearance Holes	FC49												
	**RFAC49 TMI® 9-Bolt W/Clearance Holes	FAC49												
Options	Viton	V												
	Painted (Specify)	P												
♦ Complete Stainless Steel Assembly: (including flanges, 'O' Ring seal retainers)		SS												

L Dimension will vary if OSH 'O' Ring Seal Retainer is used. (reference page C16)

Size	Dimensions (in)
	L (OS/OSA)
1 1/2"	13.00
2"	14.50
2 1/2"	18.00
3"	21.00
4"	26.00
5"	26.50
6"	31.50
8"	41.50

- ♦ STAINLESS STEEL IS AVAILABLE (CONSULT FACTORY)
- ** FOR USE ONLY WITH 9-BOLT BALL VALVE CONNECTION (REFERENCE PAGE P10)
- * NORMALLY USED FOR CONNECTION TO SPLIT FLANGE TYPE ENDS (SUPPLIED WITH OSH STYLE 'O' RING SEAL RETAINER)

PART NO. (EXAMPLE):
A/RFE - 250 - FC34 - FC34

- ASSEMBLY WORKING PRESSURE RATINGS ARE SUBJECT TO THE LESSER OF THE FLANGE OR BODY RATINGS
- SEE REFERENCE PAGE INDICATED ABOVE FOR PRESSURE RATINGS
- FOR BOLT KITS - REFERENCE SECTION R



