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Installation guide Parflange® F37 system Retaining Ring Flanges

Parker

ENGINEERING YOUR SUCCESS.

For your safety!

Under certain circumstances, tube fittings can be subjected to extreme loadings such as vibration and uncontrolled pressure peaks.

Only by using genuine Parker components and following Parker assembly instructions can you be assured of the reliability and safety of the products and their conformity to the applicable standards.

Failure to follow this rule can adversely affect the functional safety and reliability of products, cause personal injury, property damage, and result in loss of your guarantee rights.

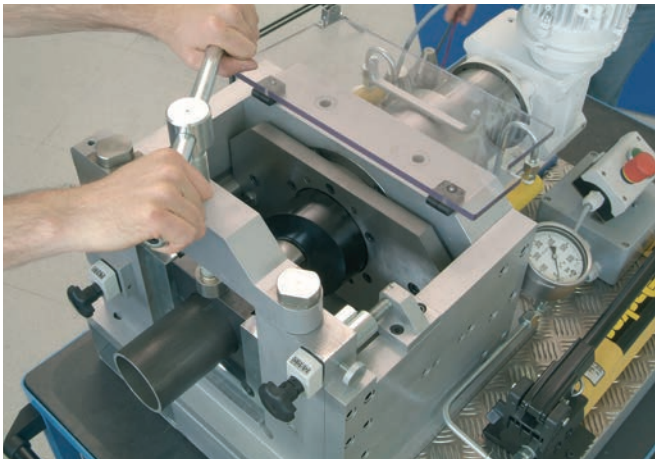
Subject to alteration

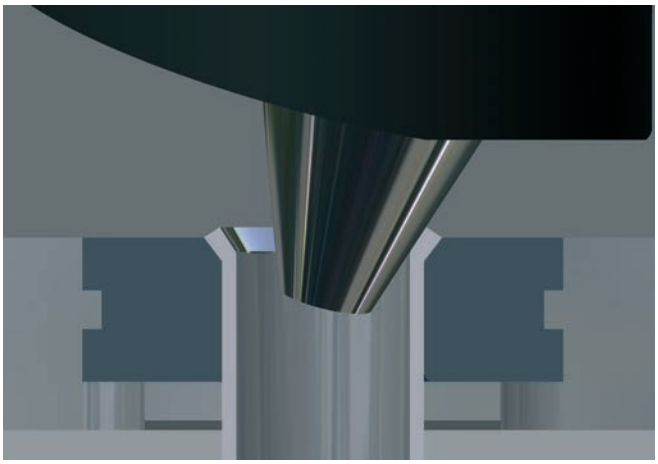
These guidelines are based on the experience of Parker Hannifin in manufacturing and assembly of the F37 Parflange and Retaining Ring system. For special applications (special sealing arrangements, non-conductive connections, special materials, etc.) please contact Parker Hannifin for further instructions. In order to achieve the integrity required in any piping system it is necessary that operators are fully trained and conversant with the tools and machines to be used. Parker Hannifin is able to provide training and instruction as well as installation supervision if required.

Parflange® technology
Parker is the inventor of the Parflange® system and knows well how to deal with flared tubes and flanged connectors. The excellent sealing performance and the high mechanical strength of Parflange® technology are achieved by continuous orbital tube forming. Proven millions of times, this connector system is backed by decades of experience. The Parflange® system belongs to Parker's leak-free Dry Technology programme. Dry Technology stands for leak-free systems with soft sealing at every connection point.

Parflange® F37
The Parflange® F37 flanged connector system is utilising this orbital tube forming technology for tubing assemblies from 16 to 165 mm (1/2" to 6" Flanges) outside diameter.
It is intended for tube wall thickness up to 9 mm and pressure ratings up to 420 bar.
For those connections, where there is no possibility to assemble a pre-flared tube or where manufacturing is limited, Parker provides the F37 Retaining Ring system. This system utilizes a Retaining Ring for flange retention along with a highly-engineered seal carrier for leak free performance. It is available as a high pressure version from 1 1/2" to 10" and as a newly developed SAE 1000 (50-70 bar) version.
The Parflange® F37 system corresponds to hole patterns according to ISO 6162-1; SAE J518; bore pattern 3000 (code 61), ISO 6162-2; bore pattern 6000 (code 62) and also ISO 6164 bore pattern.

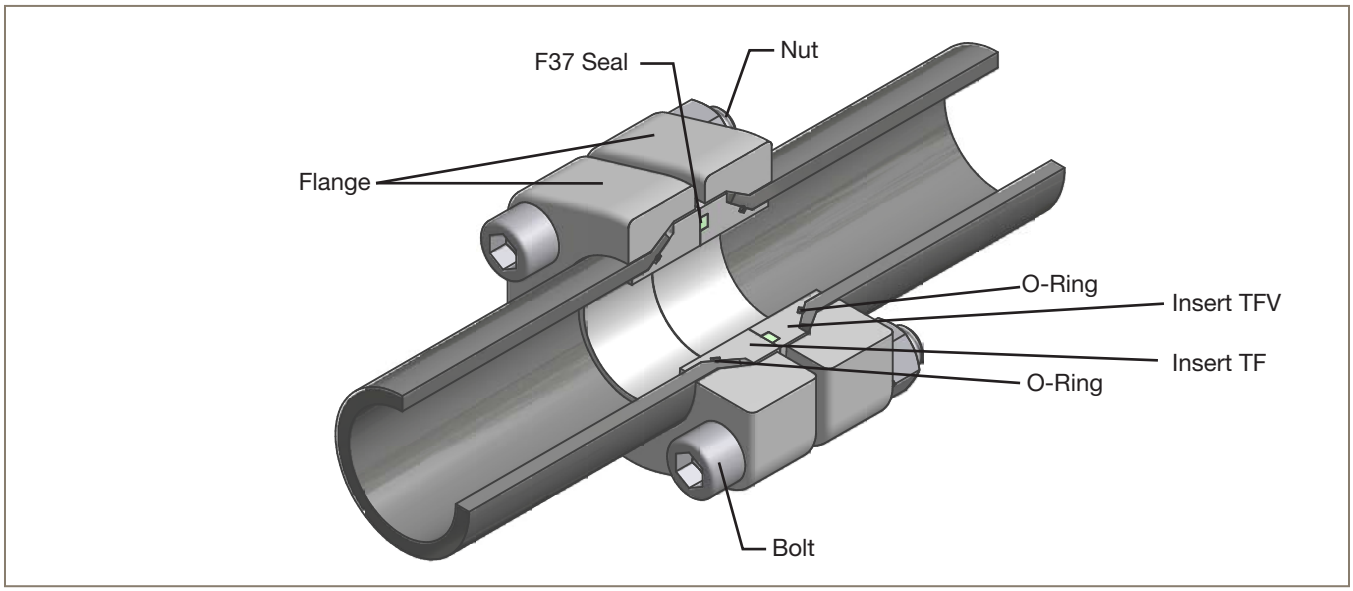
The Parflange F37 flange system is type approved by DNV, ABS and other major classification companies.



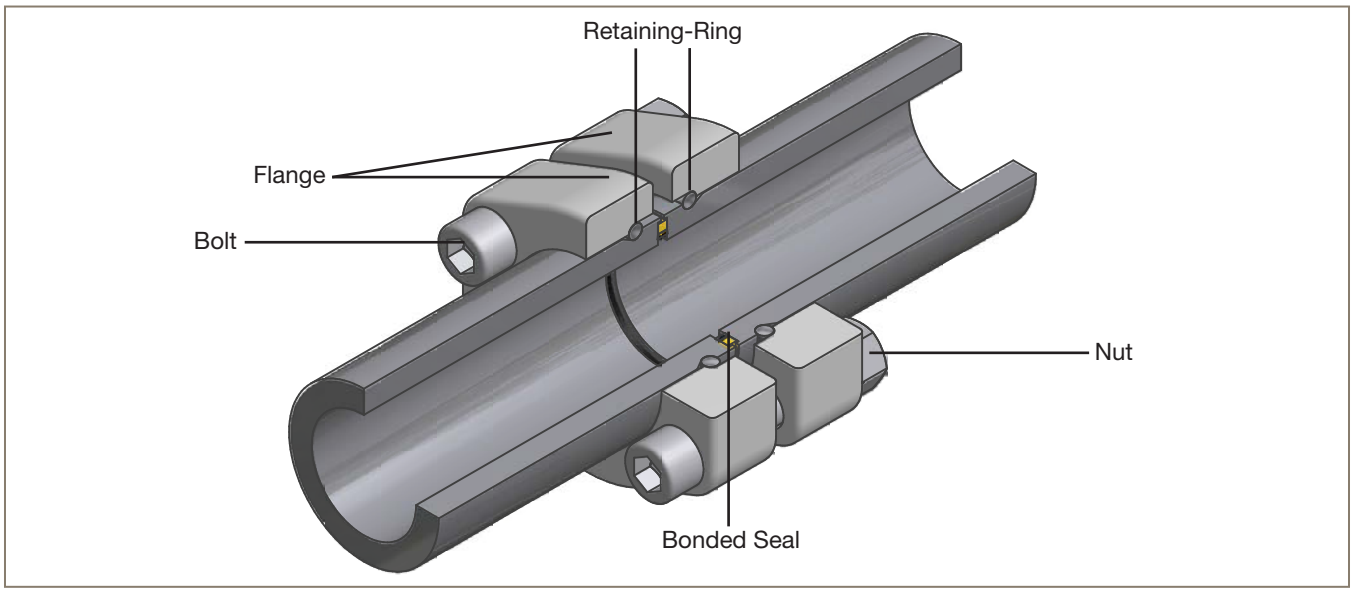


Connection technology

**The Parflange® F37 Programme consists of two flange connection technologies:
The 37° Flare Flange Connection and the Retaining Ring Connection.**

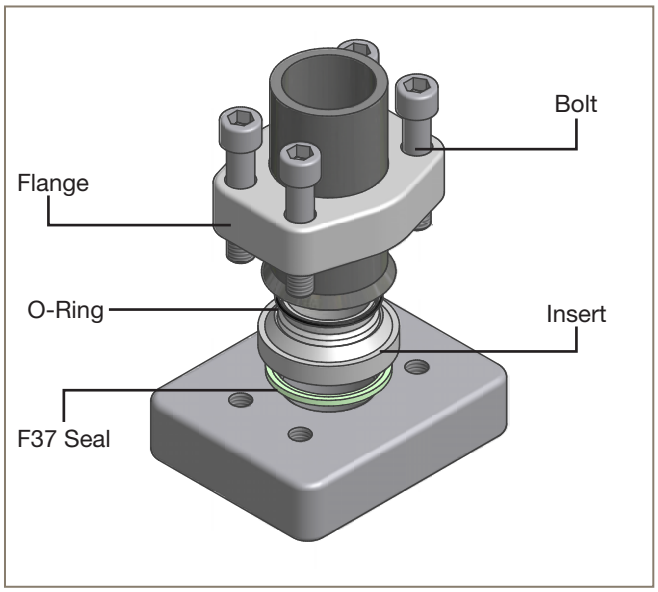


Parflange® F37 Flare Flanges – In this configuration, the deburred tube end is flared orbitally to 37° by Parflange® technology. An insert, soft sealed by an O-Ring, is located into each pipe end. In between a F37 Seal (optionally Bonded Seal or O-Ring) is placed. By tightening the flanges together, a soft sealed, high pressure tube connection is made. Available as tube-to-tube connection or tube-to-port connection.

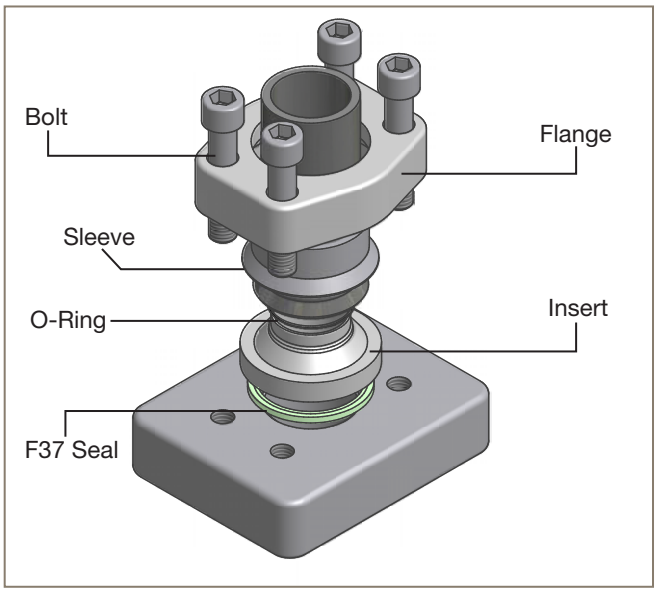


Retaining Ring Connection – The retaining ring used in this connection is a stainless steel segmented ring covered by a stainless steel spring. It is assembled in a machined groove on the tube end or adapter. When tightening this system, the flange is pushed against the retaining ring, thus giving a form tight connection. Retaining ring connections complete the Parflange® F37 range with bulkhead, male, female, weld and tube bend connections.

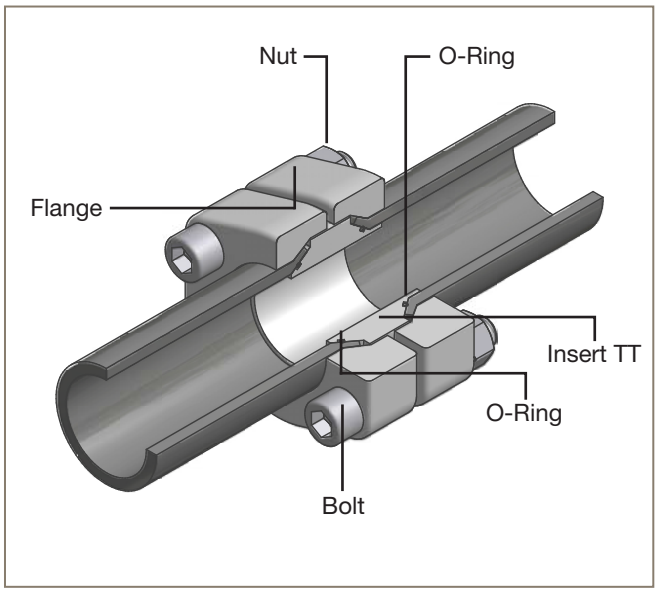
Connection methods F37 – Flared tube



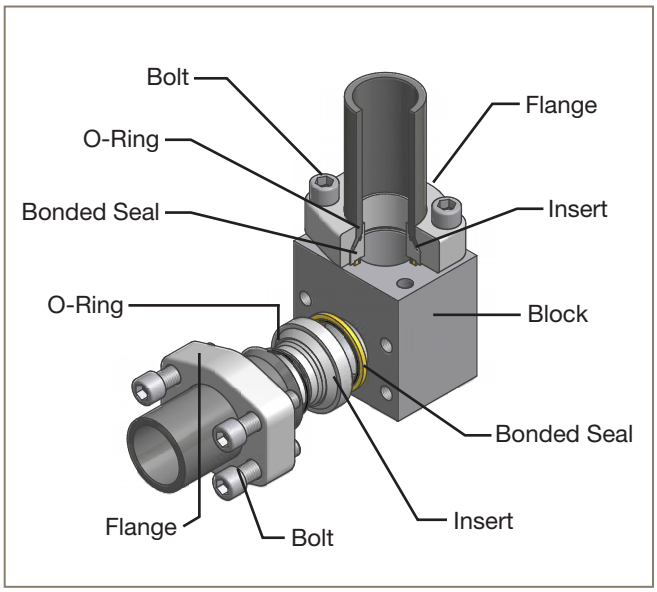
Flange to Port – the flanged tube is connected by the flange, insert and F37 seal to a port. Inserts with Bonded Seal can be used alternatively.



Flange to Port – the standard F37 Flanges can be used with adapter sleeve for smaller tube sizes as well.

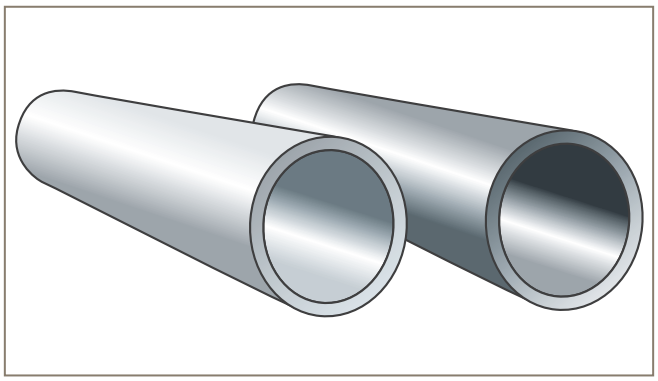


Tube to Tube – two flanges and one insert connecting two flared tubes. A two insert solution with F37 Seal or Bonded Seal is optional.



Tube to Block – instead of using flange bends compact L-Blocks are available. The range is completed by T-Blocks and Reducing Blocks. Special Manifolds according to customer design available on request.

Tube selection



- Select suitable tube material according to our tube and pipe specifications

Tube and pipe specification

Recommended carbon steel tubes and pipes

Parker recommends the use of cold drawn seamless hydraulic tubes and pipes acc. to DIN EN 10305-4.

E 355N (St. 52.4 NBK) or E 235N (St. 37.4 NBK).

+ precision dimension/shape
+ clean inside (no scale)
+ high pressure capability
+ excellent smooth surface after roll flaring

Recommended stainless steel tubes and pipes

Parker recommends the use of seamless cold drawn stainless steel tubes and pipes acc. to

ASTM A269/A213
Grade TP316L (1.4404)

+ precision dimension/shape
+ excellent smooth surface after roll flaring
+ high pressure capability

Welded tubes and pipes

Tubes and pipes acc. to above specification but welded and cold redrawn instead of seamless drawn are suitable. Pressure capability might be reduced due to the welding seam zone.

Welding seam quality might effect roll flaring surface results.

Hot rolled pipes

Hot rolled pipes are not recommended for the following reasons:

Hot rolled pipes do not have precision dimensions and may slip in machine dies.
They have scales inside and outside. The inside scales effect the cleanliness level of the fluid.
Used in roll flaring process the scales will contaminate the flaring tools (high cleaning effort) and cause poor flare surface quality.

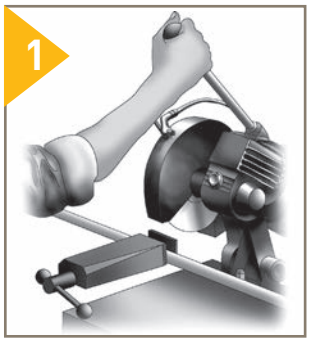
The required maximum working pressure is calculated either acc. to DNV, DIN or ANSI.

Material specifications

Material	Data Source	Yield/Tensile	Permissible stress
E235N (St37.4)	DIN EN 10305-4	min. 235/340 N/mm2	126 N/mm2 (tensile strength / 2.7)
	Tube certification	min. 235/390 N/mm2	130.5 N/mm2 (yield strength / 1.8) 5)
E355N (St52.4)	DIN EN 10305-4	min. 355/490 N/mm2	181.5 N/mm2 (tensile strength / 2.7)
	Tube certification	min. 355/533 N/mm2	197 N/mm2 (yield strength / 1.8) 5)
1.4404 (316L)	DIN EN 10216-5	min. 210/500 N/mm2	131 N/mm2 (0.2%proof stress / 1.6)
	ASTM 269 / A213 – TP 316 L and tube certification	min. 276/530 N/mm2	172.5 N/mm2 (0.2%proof stress / 1.6) 5)
1.4404 (316L)	Schedule Pipe ASTM A312 / A530 – TP 316 L and tube certification	min. 234/515 N/mm2	146 N/mm2 (0.2%proof stress / 1.6) 5)

5) Pressure rating calculation based on this mechanical properties require certification according to 3.1 - EN 10204 that confirms the mechanical properties.

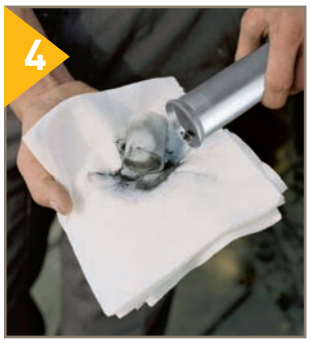
Tube preparation



- Cut and deburr thoroughly
- Cut tube squarely – max +/- 1 ° deviation
- Do not use a roller cutter or a grinder

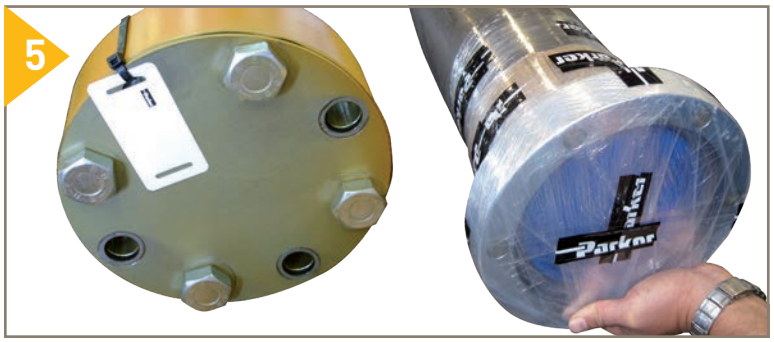
Potential mistakes:
- Tube is not cut squarely
- Use of wrong tooling

Tube cleaning and transportation preparation



⚠ Recommended final cleaning procedure:
- Place the hose, tube or pipe firmly against the nozzle to make an airtight seal.
- Depress the trigger to fire the projectile.
- Release the trigger when the projectile has exit the pipe
- Shoot through at least 2 projectiles

Above 60 mm
- High pressure hot water cleaning or oil flushing
- Preserve the contact surfaces and the tube inside with e.g. oil
- See Standard ISO 4416 (old: nas1638) for cleanliness class specifications

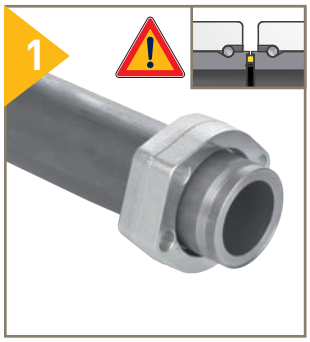


- Transport protection with a plate and rubber in between or plug against damage and dirt (see catalogue 4100 chapter M AP...)

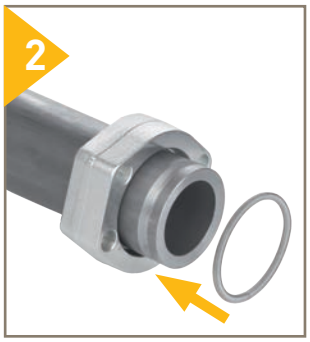
Pressure testing on request

Installation of Retaining Ring Flanges

Bonded Seal

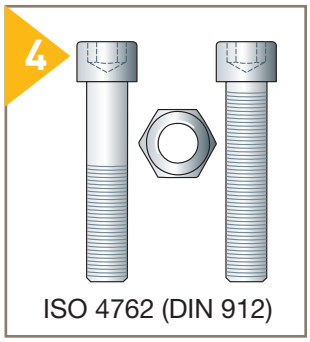


- Check for correct tube & retaining ring size (label of package)
- ⚠ Slide flange onto tube end with the retain ring groove towards the tube end



- Pipe end must be clean
- Place Retaining Ring into groove

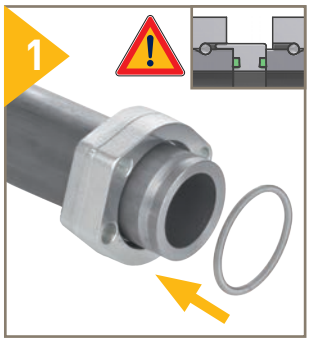
- ⚠ Make sure sealing surfaces are clean and not damaged
- Make sure the bonded seal is lubricated with grease to asure position during installation



Recommended nuts and bolts

- Be sure that the used nuts are qualified for the strength category of the bolts*

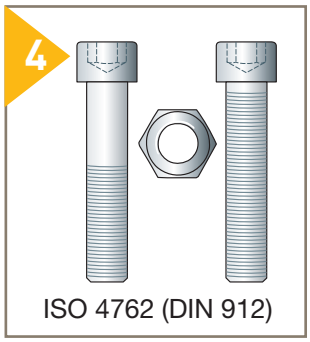
Pipe Seal Carrier



- Check for correct tube & retaining ring size (label of package)
- ⚠ Slide flange onto pipe end with the retain ring groove towards the tube end

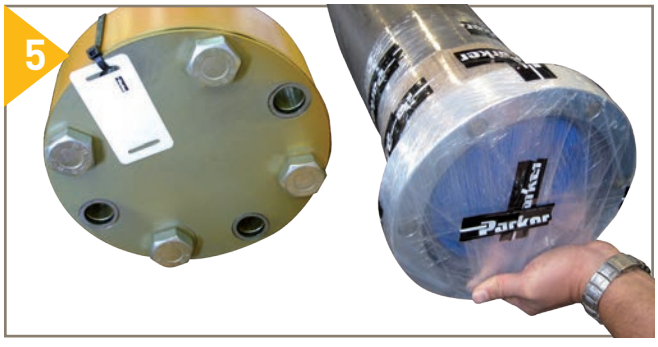
- Pipe end must be clean
- Make sure the seals are lubricated with grease to asure position during installation

- ⚠ Make sure sealing surfaces are clean and not damaged
- Place seal carrier on the tube end



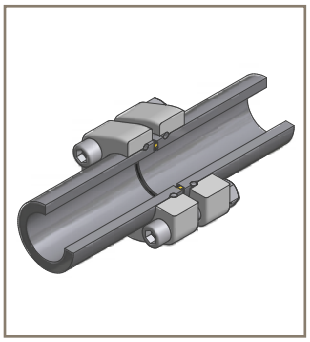
Recommended nuts and bolts

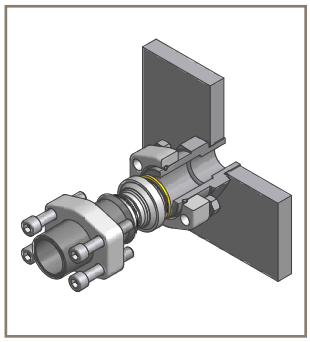
- Be sure that the used nuts are qualified for the strength category of the bolts
- Lubricate bolts acc. to following page (recommended lubrication MOLYKOTE® G-RAPID PLUS



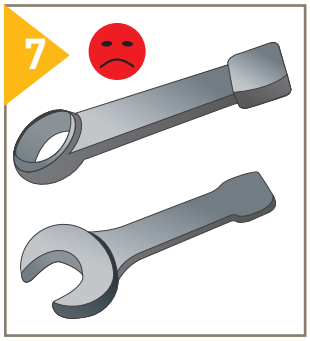
- Transport protection with a plate and rubber in between or plug against damage and dirt (see catalogue 4100 chapter M AP...)

Installation of Retaining Ring Flanges





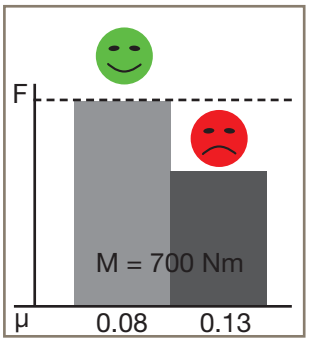
⚠ Check bolt length
⚠ Too short bolt lenght can led thread shear with the risk of disconnection under pressure



⚠ Parker recommends to use only calibrated manual or hydraulic torque tools!

Installation of Retaining Ring Flanges

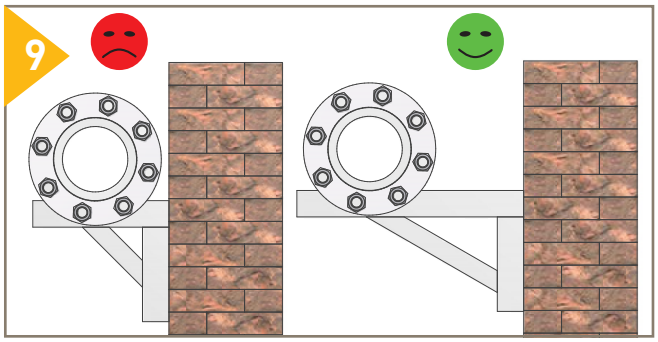
- Parker recommends to lubricate (MOLYKOTE® G-RAPID PLUS) the contact surface from the bolt head and the lower third thread of the bolt. The lubricated bolts are to be mounted immediately to avoid pollution of the thread or the surface



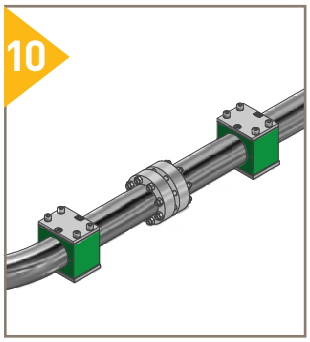
- The friction coefficient is strongly affected by proper lubrication. Using unsuitable lubrication can lead to undertighten flange connections
- ⚠ Only Parker recommended lubricants are to be used

For proper installation procedures, bolt sizes and quality torque values see next page.

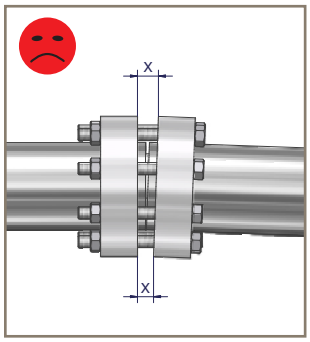
Installation of Retaining Ring Flanges: Important before bolt tightening

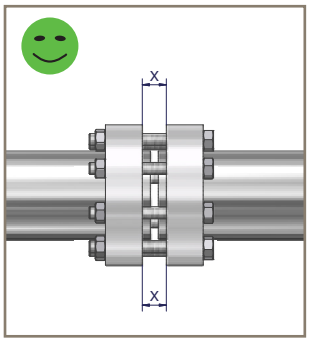


- Take care of having enough space for mounting and tooling



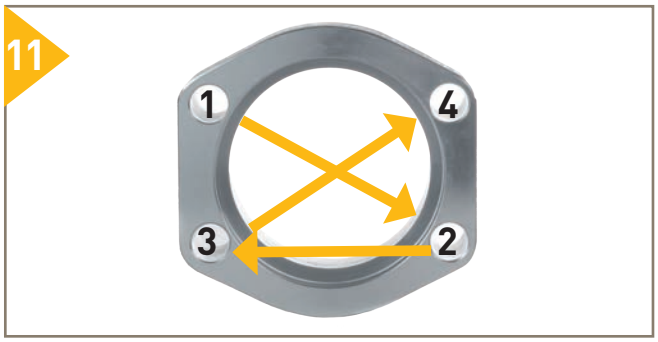
- Parker recommends to tighten the tube connection at first. After that the tube clamps can be tightend

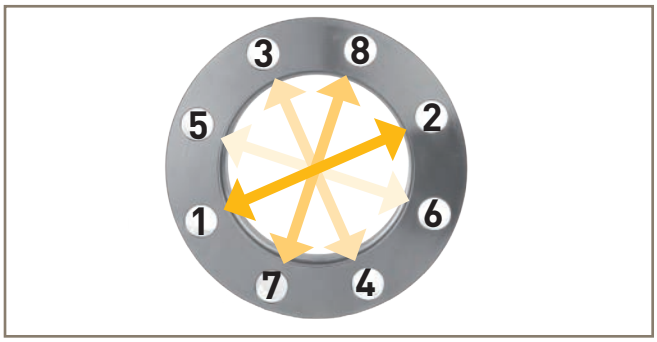




- The tubes / flanges have to be parallel and axial aligned bevor tightening the bolts. Parker does not recommend to straighten the tube by tightening the bolts of the flanges

Installation of Retaining Ring Flanges: Use of 1 tool





- Torque bolts in opposite positions in small increments to the appropriate torque level on page 19-22

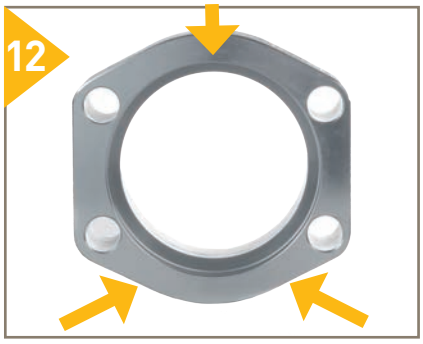
1: Light tightening with socket screw wrench by hand
2: Apply 30% of specified torque acc. to picture above.
3: Apply 60% of specified torque acc. to picture above.
4: Apply 100% of specified torque acc. to picture above.
5: Repeat step 4 .
6: Apply 100% of specified torque in circular pattern (clockwise)

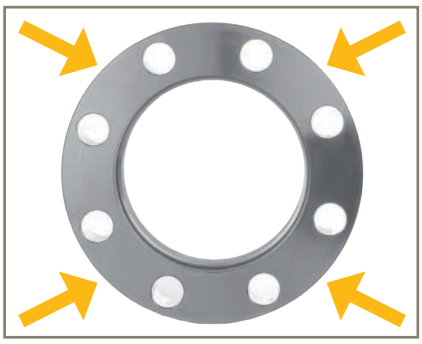
- In case of the tube lines have to be pressure tested with a pressure exceeding the working pressure of the flange (e.g. PN x 1,5 test pressure) a repeat of step 6 is required after the pressure test.

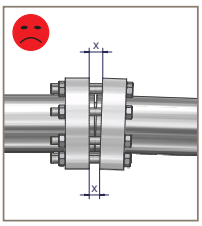
7: Retightening might be required after one week of operation depending on the dynamic of the system. We recommend to check at least 10% of the connections according to the following method:

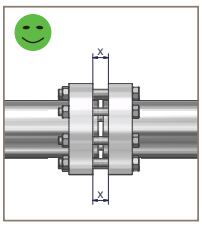
- Apply 70% of the specified torque.
- If the bolts stand still: the pretension is o.k., no further retightening required.
- If the bolts can be turned further, retorque all connections with 90% of the specified torque (1 time only)

- It is recommended to tighten this flange types with minimum two tools.





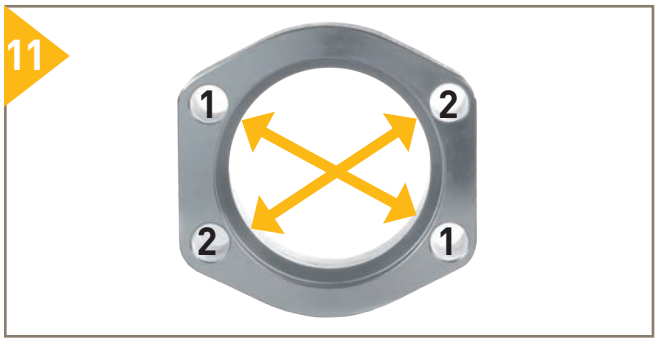


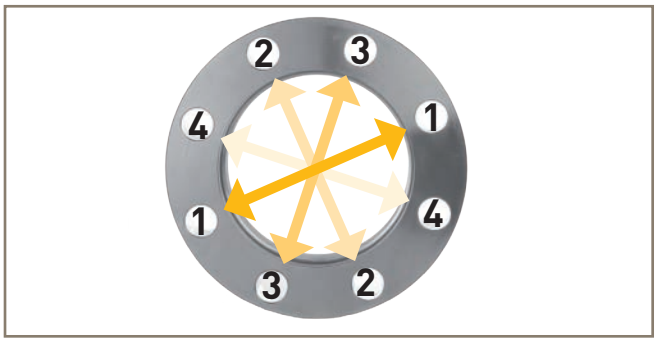


- Check:
  Flange gap must be the same at all 3 points

- Check:
  Flange gap must be the same at all 4 points (round flanges and square flanges)

Installation of Retaining Ring Flanges: Use of 2 tools





- Torque bolts in opposite positions in small increments to the appropriate torque level on page 19-22

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5: Repeat step 4 .
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- Apply 70% of the specified torque.
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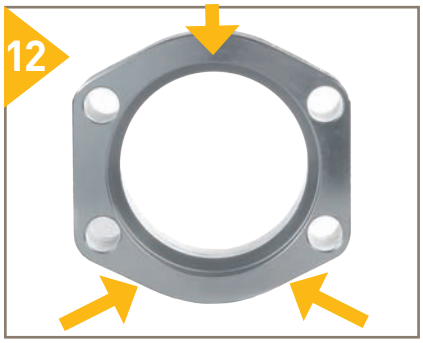
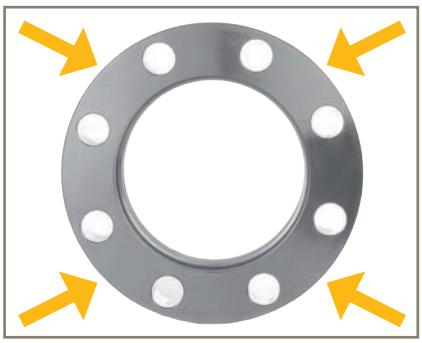
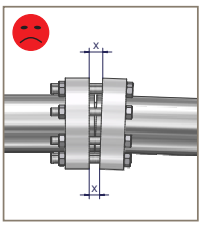
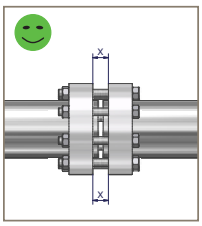
- If the bolts can be turned further, retorque all connections with 90% of the specified torque (1 time only)





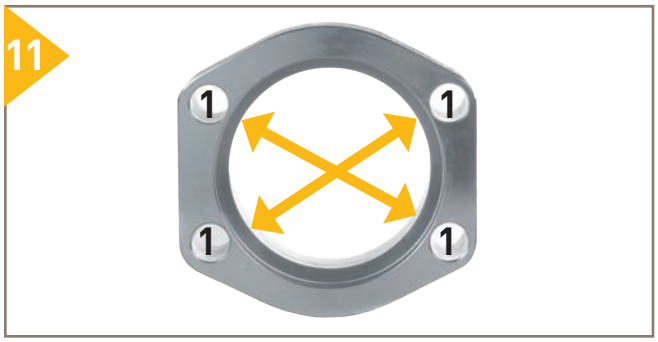


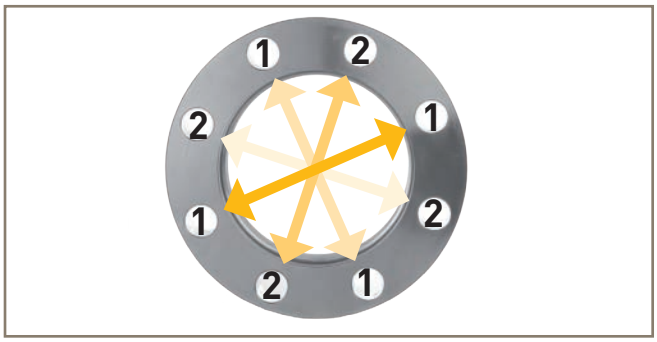


- Check:
  Flange gap must be the same at all 3 points

- Check:
  Flange gap must be the same at all 4 points (round flanges and square flanges)

Installation of Retaining Ring Flanges: Use of 4 tools





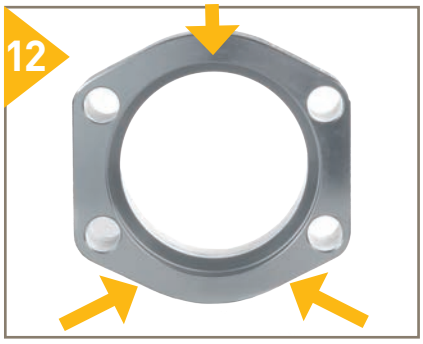
- Torque bolts in opposite positions in small increments to the appropriate torque level on page 19-22

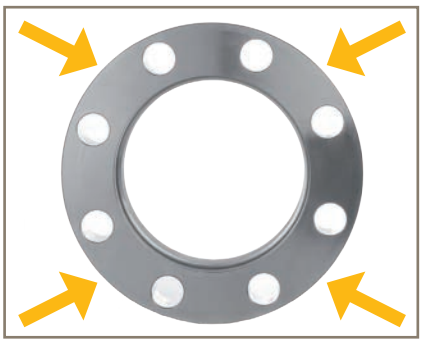
1: Light tightening with socket screw wrench by hand
2: Apply 100% of specified torque acc. to picture above.
3: Apply 100% of specified torque in circular pattern (clockwise)

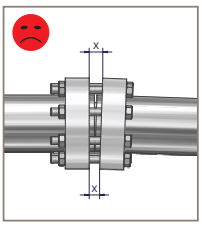
- In case of the tube lines have to be pressure tested with a pressure exceeding the working pressure of the flange (e.g. PN x 1,5 test pressure) a repeat of step 3 is required after the pressure test.

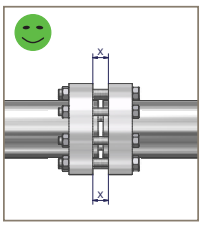
4: Retightening might be required after one week of operation depending on the dynamic of the system. We recommend to check at least 10% of the connections according to the following method:

- Apply 70% of the specified torque.
- If the bolts stand still: the pretension is o.k., no further retightening required.
- If the bolts can be turned further, retorque all connections with 90% of the specified torque (1 time only)





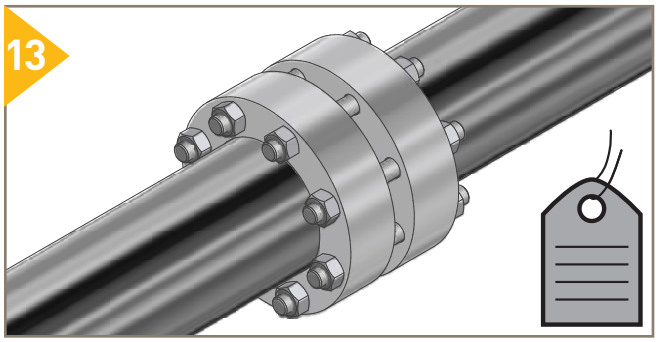




- Check:
  Flange gap must be the same at all 3 points

- Check:
  Flange gap must be the same at all 4 points (round flanges and square flanges)

Installation of Retaining Ring Flanges: Important after bolt tightening



- Parker recommends to take mounting documentation for every flange connection

Reassembly:

- Mark the component positions before disconnecting.
- Check seals for damage and deformation and replace if required
- Reassemble according to the same procedure as the initial tightening

Appropriate torque level - SAE 1000/ISO 6162-1 footprint

SAE 1000 Retaining Ring, working pressure up to 70 bar

Flange Type	Soft Seal / Flat Face		Nut	Recommended torques*			
	Recommended Bolts Tube to Port	Recommended Bolts Tube to Tube		ZNFL (10.9)	ELZ (8.8)	HDG (8.8)	A4-80
R-124	4x ZYLS12X40	4x ZYLS12X65	4x ISO4032-M12	not recommended	45Nm	50Nm	45Nm
R-132	4x ZYLS12X40	4x ZYLS12X65	4x ISO4032-M12	not recommended	45Nm	50Nm	45Nm
R-140	4x ZYLS12X40	4x ZYLS12X65	4x ISO4032-M12	not recommended	45Nm	50Nm	45Nm
R-148	4x ZYLS16X50	4x ZYLS16x80	4x ISO4032-M16	not recommended	85Nm	95Nm	85Nm
R-156	4x ZYLS16X55	4x ZYLS16X90	4x ISO4032-M16	not recommended	85Nm	95Nm	85Nm
R-164	4x ZYLS16x55	4x ZYLS16X90	4x ISO4032-M16	not recommended	85Nm	95Nm	85Nm
R-180	4x ZYLS16X70	4x ZYLS16X110	4x ISO4032-M16	not recommended	100Nm	110Nm	100Nm
R-196	6x ZYLS16X70	6x ZYLS16X110	6x ISO4032-M16	not recommended	100Nm	110Nm	100Nm

SAE 1000 Retaining Ring, working pressure up to 50 bar

Flange Type	Soft Seal / Flat Face		Nut	Recommended torques*			
	Recommended Bolts Tube to Port	Recommended Bolts Tube to Tube		ZNFL (10.9)	ELZ (8.8)	HDG (8.8)	A4-80
R-1128	8x ZYLS20X70	8x ZYLS20X120	8x ISO4032-M20	not recommended	175Nm	195Nm	175Nm
R-1160	8x ZYLS20X80	8x ZYLS20X150	8x ISO4032-M20	not recommended	175Nm	195Nm	175Nm

*Use for bolts acc. ISO 4762 (DIN 912) lubricated with MOLYKOTE® G-RAPID PLUS Description in parentheses = property class for screws

ZNFL: Zinc flaked
ELZ: Electrolytic zinc plated
HDG: Hot dipped galvanized
A4-80: Stainless steel

Appropriate torque level - SAE 3000/ISO 6162-1 footprint

SAE 3000 Retaining Ring, working pressure up to 350 bar

Flange Type	F37 Seal / Flat Face / Bonded Seal		Nut	Recommended torques*			
	Recommended Bolts Tube to Port	Recommended Bolts Tube to Tube		ZNFL (10.9)	ELZ (8.8)	HDG (8.8)	A4-80
R-308	4x ZYLS8X35	4x ZYLS8X60	4x ISO4032-M8	21Nm	15Nm	15Nm	15Nm
R-312	4x ZYLS10X40	4x ZYLS10X65	4x ISO4032-M10	43Nm	31Nm	31Nm	31Nm
R-316	4x ZYLS10X40	4x ZYLS10X70	4x ISO4032-M10	43Nm	31Nm	31Nm	31Nm

SAE 3000 Retaining Ring, working pressure up to 280 bar

Flange Type	F37 Seal / Flat Face / Bonded Seal		Pipe Seal Carrier (PSC)		Nut	Recommended torques*			
	Recommended Bolts Tube to Port	Recommended Bolts Tube to Tube	Recommended Bolts Tube to Port	Recommended Bolts Tube to Tube		ZNFL (10.9)	ELZ (8.8)	HDG (8.8)	A4-80
R-320	4x ZYLS10X40	4x ZYLS10X70	4x ZYLS10X50	4x ZYLS10X80	4x ISO4032-M10	43Nm	31Nm	31Nm	31Nm
R-324	4x ZYLS12X50	4x ZYLS12X80	4x ZYLS12X55	4x ZYLS12X90	4x ISO4032-M12	75Nm	60Nm	65Nm	55Nm
R-332	4x ZYLS12X55	4x ZYLS12X90	4x ZYLS12X65	4x ZYLS12X100	4x ISO4032-M12	75Nm	60Nm	65Nm	55Nm

SAE 3000 Retaining Ring, working pressure up to 210 bar

Flange Type	F37 Seal / Flat Face / Bonded Seal		Pipe Seal Carrier (PSC)		Nut	Recommended torques*			
	Recommended Bolts Tube to Port	Recommended Bolts Tube to Tube	Recommended Bolts Tube to Port	Recommended Bolts Tube to Tube		ZNFL (10.9)	ELZ 8.8)	HDG (8.8)	A4-80
R-340	4x ZYLS12X65	4x ZYLS12X120	4x ZYLS12X80	4x ZYLS12X130	4x ISO4032-M12	75Nm	60Nm	65Nm	55Nm
R-348	4x ZYLS16X80	4x ZYLS16X130	4x ZYLS16X90	4x ZYLS16X150	4x ISO4032-M16	175Nm	125Nm	140Nm	125Nm

*Use for bolts acc. ISO 4762 (DIN 912) lubricated with MOLYKOTE® G-RAPID PLUS Description in parentheses = property class for screws

ZNFL: Zinc flaked
ELZ: Electrolytic zinc plated
HDG: Hot dipped galvanized
A4-80: Stainless steel

Appropriate torque level - SAE 6000/ISO 6162-2 footprint

SAE 6000 Retaining Ring, Working pressure up to 420 bar

Flange Type	F37 Seal / Flat Face / Bonded Seal		Pipe Seal Carrier (PSC)		Nut	Recommended torques*			
	Recommended Bolts Tube to Port	Recommended Bolts Tube to Tube	Recommeded Bolts Tube to Port	Recommended Bolts Tube to Tube		ZNFL (10.9)	ELZ (8.8)	HDG (8.8)	A4-80
R-608	4x ZYLS8X35	4x ZYLS8X60	–	–	4x ISO4032-M8	21Nm	15Nm	15Nm	15Nm
R-612	4x ZYLS10X45	4x ZYLS10X70	–	–	4x ISO4032-M10	43Nm	31Nm	31Nm	31Nm
R-616	4x ZYLS12X45	4x ZYLS12X80	–	–	4x ISO4032-M12	75Nm	60Nm	65Nm	55Nm
R-620	4x ZYLS14X55	4x ZYLS14X90	4x ZYLS14X60	4x ZYLS14X100	4x ISO4032-M14	115Nm	80Nm	90Nm	80Nm
R-620H12	4x ZYLS12X55	4x ZYLS12X90	4x ZYLS12X60	4x ZYLS12X100	4x ISO4032-M12	75Nm	60Nm	65Nm	55Nm
R-624	4x ZYLS16X60	4x ZYLS16X100	4x ZYLS16X70	4x ZYLS16X110	4x ISO4032-M16	175Nm	125Nm	140Nm	125Nm
R-632	4x ZYLS20X70	4x ZYLS20X120	4x ZYLS20X80	4x ZYLS20X130	4x ISO4032-M20	250Nm	175Nm	195Nm	175Nm
R-640	4x ZYLS24X90	4x ZYLS24X150	4x ZYLS24X110	4x ZYLS24X160	4x ISO4032-M24	435Nm	315Nm	340Nm	340Nm
R-648	4x ZYLS30X100	4x ZYLS30X160	4x ZYLS30X120	4x ZYLS30X170	4x ISO4032-M30	840Nm	600Nm	665Nm	665Nm

*Use for bolts acc. ISO 4762 (DIN 912) lubricated with MOLYKOTE® G-RAPID PLUS Description in parentheses = property class for screws

ZNFL: Zinc flaked
ELZ: Electrolytic zinc plated
HDG: Hot dipped galvanized
A4-80: Stainless steel

Appropriate torque level - ISO 6164 footprint

ISO 6164 Retaining Ring, working pressure up to 400 bar

Flange Type	F37 Seal / Flat Face / Bonded Seal		Pipe Seal Carrier (PSC)		Nut	Recommended torques*			
	Recommended Bolts Tube to Port	Recommended Bolts Tube to Tube	Recommeded Bolts Tube to Port	Recommended Bolts Tube to Tube		ZNFL (10.9)	ELZ (8.8)	HDG (8.8)	A4-80
R-432	4x ZYLS16X65	4x ZYLS16X110	4x ZYLS16X75	4x ZYLS16X130	4x ISO4032-M16	175Nm	125Nm	140Nm	125Nm
R-440	4x ZYLS20X80	4x ZYLS20X140	4x ZYLS20X95	4x ZYLS20X150	4x ISO4032-M20	250Nm	210Nm	230Nm	210Nm
R-448	4x ZYLS24X90	4x ZYLS24X150	4x ZYLS24X100	4x ZYLS24X160	4x ISO4032-M24	435Nm	350Nm	390Nm	350Nm
R-464	4x ZYLS30X120	4x ZYLS30X190	4x ZYLS30X130	4x ZYLS30X200	4x ISO4032-M30	840Nm	635Nm	665Nm	665Nm

ISO 6164 Retaining Ring, working pressure up to 350 bar

Flange Type	F37 Seal / Flat Face / Bonded Seal		Pipe Seal Carrier (PSC)		Nut	Recommended torques*			
	Recommended Bolts Tube to Port	Recommended Bolts Tube to Tube	Recommended Bolts Tube to Port	Recommended Bolts Tube to Tube		ZNFL (10.9)	ELZ (8.8)	HDG (8.8)	A4-80
R-872	8x ZYLS20X90	8x ZYLS20X160	8x ZYLS20X115	8x ZYLS20X190	4x ISO4032-M20	275Nm	225Nm	245Nm	225Nm
R-880	8x ZYLS24X110	8x ZYLS24X190	8x ZYLS24X140	8x ZYLS24X220	4x ISO4032-M24	435Nm	400Nm	440Nm	440Nm
R-896**	8x ZYLS30X110	8x ZYLS30X190	8x ZYLS30X150	8x ZYLS30X230	4x ISO4032-M30	840Nm	635Nm	665Nm	665Nm

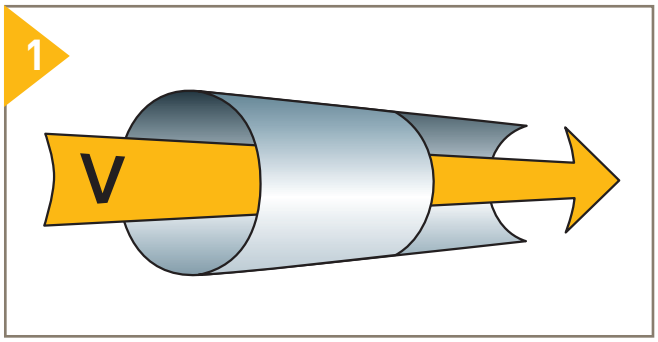
ISO 6164 Retaining Ring, working pressure up to 250 bar

Flange Type	F37 Seal / Flat Face / Bonded Seal		Pipe Seal Carrier (PSC)		Nut	Recommended torques*			
	Recommended Bolts Tube to Port	Recommended Bolts Tube to Tube	Recommended Bolts Tube to Port	Recommended Bolts Tube to Tube		ZNFL (10.9)	ELZ (8.8)	HDG (8.8)	A4-80
R-8128219.1**	8x ZYLS30X130	8x ZYLS30X220	8x ZYLS30X170	8x ZYLS30X260	8x ISO4032-M30	860Nm	765Nm	845Nm	845Nm
R-8128**	8x ZYLS36X130	8x ZYLS36X220	8x ZYLS36X170	8x ZYLS36X260	8x ISO4032-M36	1465Nm	1145Nm	1265Nm	1265Nm
R-8160273**	12x ZYLS36X130	12x ZYLS36X220	12x ZYLS36x170	12x ZYLS36X260	12x ISO4032-M36	1150Nm	1025Nm	1130Nm	1130Nm

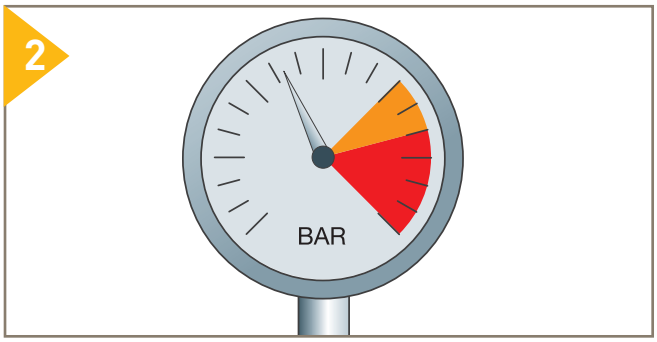
*Use for bolts acc. ISO 4762 (DIN 912) lubricated with MOLYKOTE® G-RAPID PLUS Description in parentheses = property class for screws
**No Bonded Seal available for this size

ZNFL: Zinc flaked
ELZ: Electrolytic zinc plated
HDG: Hot dipped galvanized
A4-80: Stainless steel

Getting pipework ready for operation



- System must be completely cleaned

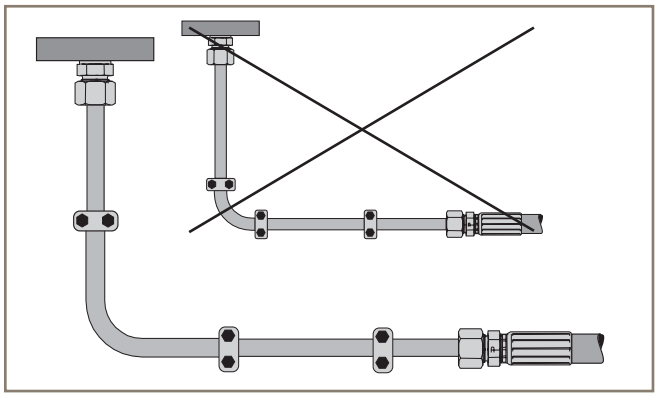


- System must be leakage and pressure tested according to project or classification specification
- Follow all relevant safety regulations

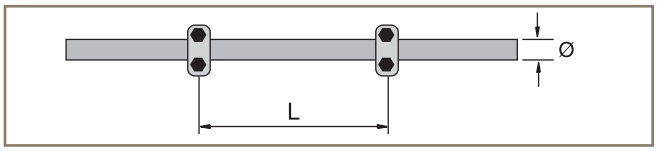
Reassembly

- Make sure that there is no pressure in the system
- Disassembling has to be done with great caution
- Loosen bolts similar to assembly. During disassembling make sure that there is no pressure left in the system
- Parker recommends that all sealings, nuts and bolts are replaced before reassembling
- For reassembling follow the installation instructions above
- For further information or direct support see last page

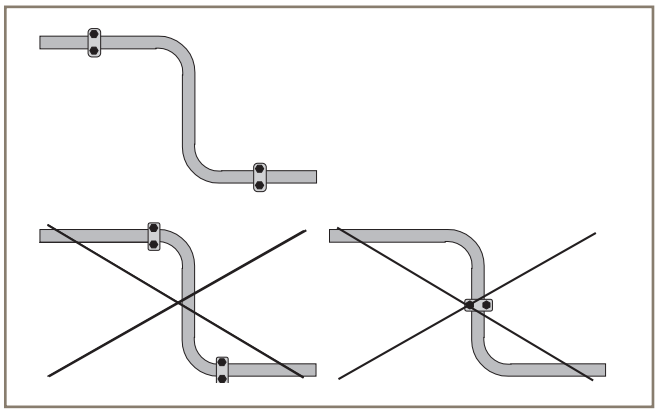
Tube line fabrication guide for leak-free systems



- Tube lines have to be supported in certain distances
- Use sufficient tube clamps to support weight
- Use sufficient tube clamps to protect joints from vibration
- Vibration has to be eliminated near by the connectors



Ø [mm]	Marine/Offshore L [m]	Industrial/Landbased L [m]
6.0 - 12.7	1.0	1.0
12.7 - 22.0	1.1	1.2
22.0 - 32.0	1.4	1.5
32.0 - 38.0	1.5	1.5
38.0 - 57.0	1.8	2.0
57.0 - 75.0	2.0	2.0
75.0 - 76.1	2.1	
76.1 - 88.9	2.2	
88.9 - 102.0	2.5	
102.0 - 114.0	2.5	
114.0 - 168.0	2.5	
168.0 - 219.0	2.5	



- Allow expansion and contraction. Do not hamper expansion and contraction near by tube bends:

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