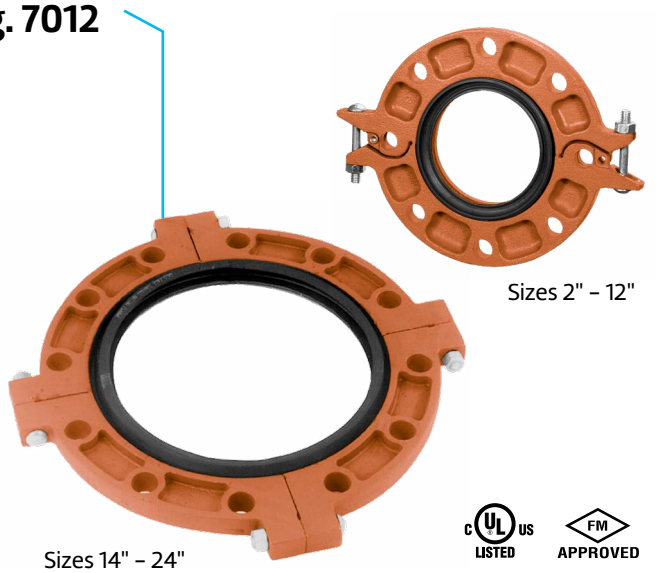
Gruvlok® Flanges
Fig. 7012



The Gruvlok Fig. 7012 Flange allows direct connection of Class 125 or Class 150 flanged components to a grooved piping system. The two interlocking halves of the 2" thru 12" sizes of the Gruvlok Flange are hinged for ease of handling, and are drawn together by a latch bolt which eases assembly on the pipe. Precision machined bolt holes, key and mating surfaces assure concentricity and flatness to provide exact fit-up with flanged, lug, and wafer styles of pipe system equipment. A specially designed gasket provides a leak-tight seal on both the pipe and the mating flange face.

The 14" thru 24" sizes of the Gruvlok Fig. 7012 Flange are cast in four segments. A sleek profile gasket design allows quick and easy assembly of the Gruvlok Flange onto the pipe.

All Gruvlok Fig. 7012 Flanges have designed-in anti-rotation tines which bite into and grip the sides of the pipe grooves to provide a secure, rigid connection.

The Gruvlok Fig. 7012 Flange requires the use of a steel adapter insert when used against rubber faced surfaces, wafer/lug design valves and serrated or irregular sealing surfaces. In copper systems a phenolic adapter insert is required, in place of the steel adapter insert. (See Installation and Assembly Instructions Section or contact your ASC Engineered Solutions™ Representative for details.)

For Listings/Approval Details and Limitations, visit our website at www.asc-es.com or contact an ASC Engineered Solutions Sales Representative.

Material Specifications

Latch Bolt (2" – 12"), Segment Bolt (14" – 24")
SAE J429, Grade 5, Zinc Electroplated

ISO 898-1, Class 8.8, Zinc Electroplated followed by a Yellow Chromate Dip

Latch Nut (2" – 12"), Segment Nut (14" – 24")
ASTM A563, Grade A, Zinc Electroplated

ISO 898-2, Class 8.8, Zinc Electroplated followed by a Yellow Chromate Dip

Housing
Ductile Iron conforming to ASTM A536, Grade 65-45-12.

Coatings
☐ Rust inhibiting paint
Color: Orange (standard), Red (optional)

☐ Hot Dipped Zinc Galvanized (optional)

☐ Other Colors Available
(IE: RAL3000 and RAL9000)

For other Coating requirements contact an ASC Engineered Solutions Representative.

Gasket Materials
Properties as designated in accordance with ASTM D2000

☐ **Grade "E" EPDM** (Green color code)
-40°F to 230°F (Service Temperature Range)
(-40°C to 110°C)

Recommended for water service, diluted acids, alkalies solutions, oil-free air and many other chemical services.

NOT FOR USE IN PETROLEUM APPLICATIONS.

☐ **Grade "T" Nitrile** (Orange color code)
-20°F to 180°F (Service Temperature Range)
(-29°C to 82°C)

Recommended for petroleum applications. Air with oil vapors and vegetable and mineral oils.

NOT FOR USE IN HOT WATER.

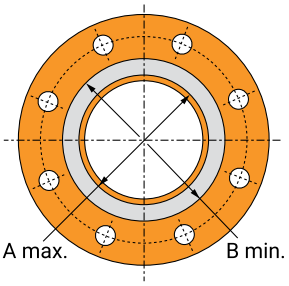
Lubrication
☐ Standard Gruvlok

☐ Gruvlok Xtreme (Do not use with Grade "L")

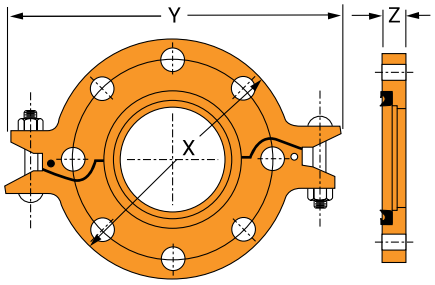
GRUVLOK
An ASC Engineered Solution

PROJECT INFORMATION	APPROVAL STAMP
Project:	☐ Approved
Address:	☐ Approved as noted
Contractor:	☐ Not approved
Engineer:	Remarks:
Submittal Date:	
Notes 1:	
Notes 2:	

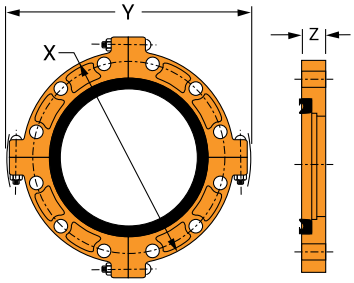
Gruvlok® Flanges
Fig. 7012



Mating Flange



2" – 12" sizes



14" – 24" sizes

Nominal Size	O.D.	Max. Working Pressure†	Max. End Load▼	Latch Bolt			Dimensions			Sealing Surface		Mating Flange Bolts						Approx. Wt. Ea.
				Latch Bolt Size*	Specified Torque §		X	Y	Z	A Max.	B Min.	Mating Flange Bolts		Bolt Circle Diameter	Bolt Hole Diameter	Specified Torque §		
					Min.	Max.						Qty. ANSI	Size (ANSI)			Min.	Max.	
DN(mm) In./	In./mm	PSI/bar	Lbs./kN	In./mm	Ft.-Lbs/N-m		In./mm	In./mm	In./mm	In./mm	In./mm	PN10 (16)	In. (ISO) mm	In./mm	In./mm	Ft.-Lbs/N-m		Lbs./kg
2 50	2.375 60.3	300 20.7	1,329 5.91	3/8 x 2 3/4 M10 x 70	30 40	45 60	6 1/4 159	8 3/8 213	3/4 19	2 3/8 60	3 7/16 87	4 4	5/8 x 2 3/4 M16 x 70	4 3/4 120.7	3/4 19.1	110 149	140 190	4.2 1.9
2 1/2 65	2.875 73.0	300 20.7	1,948 8.66	3/8 x 2 3/4 M10 x 70	30 40	45 60	7 178	9 1/2 241	3/4 19	2 7/8 73	4 102	4 –	5/8 x 2 3/4 M16 x 70	5 1/2 139.7	3/4 19.1	110 149	140 190	4.6 2.1
3 O.D. 76.1	2.996 76.1	300 20.7	2,115 9.41	– M10 x 70	30 40	45 60	7 1/4 184	9 3/4 248	3/4 19	3 76	4 1/8 105	– 4	– M16 x 70	– –	– –	110 149	140 190	4.8 2.2
3 88.9	3.500 88.9	300 20.7	2,886 12.84	3/8 x 2 3/4 M10 x 70	30 40	45 60	7 7/8 200	10 1/2 267	3/4 19	3 1/2 89	4 9/16 116	4 8	5/8 x 2 3/4 M16 x 70	6 152.4	3/4 19.1	110 149	140 190	6.0 2.7
4 100	4.500 114.3	300 20.7	4,771 21.22	3/8 x 2 3/4 M10 x 70	30 40	45 60	9 229	11 1/2 292	3/4 19	4 1/2 114	5 9/16 141	8 8	5/8 x 2 3/4 M16 x 70	7 1/2 190.5	3/4 19.1	110 149	140 190	6.3 2.9
5 1/2 139.7	5.500 139.7	300 20.7	7,127 31.70	– M10 x 70	30 40	45 60	9 7/8 251	12 7/8 327	7/8 22	5 9/16 141	6 3/4 171	– 8	– M16 x 75	– –	– –	220 298	250 339	15.6 7.1
5 125	5.563 141.3	300 20.7	7,292 32.44	3/8 x 2 3/4 M10 x 70	30 40	45 60	10 254	12 1/2 318	7/8 22	5 9/16 141	6 3/4 171	8 –	3/4 x 2 7/8 –	8 1/2 215.9	7/8 22.2	220 298	250 339	8.8 4.0
6 1/2 165.1	6.500 165.1	300 20.7	9,955 44.28	– M10 x 70	30 40	45 60	11 1/4 286	14 356	7/8 22	6 5/8 168	7 13/16 198	– 8	– M20 x 80	– –	– –	220 298	250 339	9.7 4.4
6 150	6.625 168.3	300 20.7	10,341 46.00	3/8 x 2 3/4 M10 x 70	30 40	45 60	11 279	14 356	7/8 22	6 5/8 168	7 13/16 198	8 8	3/4 x 3 1/8 M20 x 80	9 1/2 241.1	7/8 22.2	220 298	250 339	9.6 4.4
8 200	8.625 219.1	300 20.7	17,528 77.97	3/8 x 2 3/4 M10 x 70	30 40	45 60	13 1/2 343	16 1/2 419	1 25	8 5/8 219	10 254	8 8 (12)	3/4 x 3 1/4 M20 x 80	11 3/4 298.5	7/8 22.2	220 298	250 339	15.6 7.1
10 250	10.750 273.1	300 20.7	27,229 121.12	3/8 x 2 3/4 M10 x 70	30 40	45 60	16 406	19 483	1 25	10 3/4 273	12 1/8 308	12 12	7/8 x 3 1/2 M20 x 90	14 1/4 362.0	1 25.4	320 439	400 542	18.2 8.3

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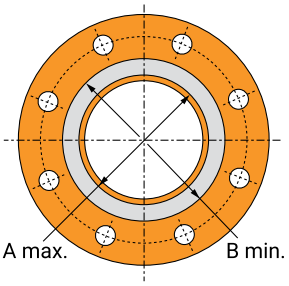
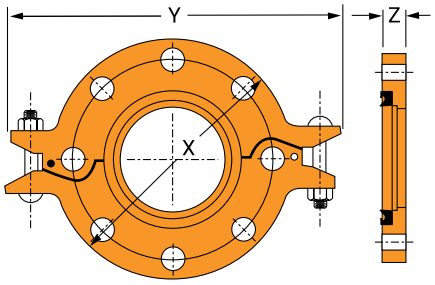
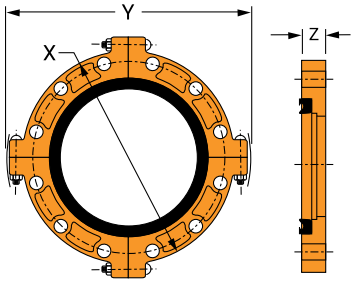
Gruvlok® Flanges (continued)
Fig. 7012



Mating Flange



2" – 12" sizes



14" – 24" sizes

Nominal Size	O.D.	Max. Working Pressure†	Max. End Load▼	Latch Bolt			Dimensions			Sealing Surface		Mating Flange Bolts						Approx. Wt. Ea.
				Latch Bolt Size*	Specified Torque § Min.	Max.	X	Y	Z	A Max.	B Min.	Mating Flange Bolts Qty. ANSI	Size (ANSI)	Bolt Circle Diameter	Bolt Hole Diameter	Specified Torque § Min.	Max.	
In./ DN(mm)	In./mm	PSI/bar	Lbs./kN	In./mm	Ft.-Lbs/N-m		In./mm	In./mm	In./mm	In./mm	In./mm	PN10 (16)	In. (ISO) mm	In./mm	In./mm	Ft.-Lbs/N-m		Lbs./kg
12 300	12.750 323.9	300 20.7	38,303 170.38	⅜ x 2¾ M10 x 70	30 40	45 60	19 483	21¾ 552	1¼ 32	12¾ 324	14⅛ 359	12 12	⅞ x 3¾ –	17 431.8	1 25.4	320 439	400 542	29.9 13.6
14 350	14.000 355.6	300 20.7	46,181 205.43	⅝ x 4¼ –	100 136	130 176	21 533	24 610	1½ 38	14 356	16 406	12 –	1 x 4¼ –	18¾ 476.3	1⅛ 28.6	360 488	520 705	52.5 23.8
16 400	16.000 406.4	300 20.7	60,319 268.31	⅝ x 4¼ –	100 136	130 176	23½ 597	26½ 673	1½ 38	16 406	18 457	16 –	1 x 4¼ –	21¼ 539.8	1⅛ 28.6	360 488	520 705	67.0 30.4
18 450	18.000 457.2	300 20.7	76,341 339.58	¾ x 5 –	130 176	180 244	25 635	29 737	1⅝ 41	18 457	20 508	16 –	1⅛ x 4¾ –	22¾ 577.9	1¼ 31.8	450 610	725 983	82.5 37.4
20 500	20.000 508.0	300 20.7	94,248 419.23	¾ x 5 –	130 176	180 244	27½ 699	31½ 800	1¾ 44	20 508	22 559	20 –	1⅛ x 4¾ –	25 635.0	1¼ 31.8	450 610	725 983	106.5 48.3
24 600	24.000 609.6	250 17.2	113,097 503.08	⅞ x 5½ –	180 244	220 298	32 813	36½ 927	1⅞ 48	24 610	26 660	20 –	1⅛ x 5½ –	29½ 749.3	1⅜ 34.92	620 841	1,000 1,356	138.5 62.8

Note:

† Maximum Working Pressure Rating is for schedule 40 steel pipe. For light wall, stainless steel, aluminum and ISO pipe pressure ratings, please refer to the technical data section.
The Gruvlok Flange bolt hole pattern conforms to ANSI Class 150 and Class 125 flanges.
To avoid interference issues, flanges cannot be assembled directly to Series 7700 butterfly valve. Flange can be assembled to one side of series 7500 and 7600 valve only.
Mating flange bolts must be at least Intermediate Strength Bolting per ASME B16.5. Bolts with material properties equal or greater than SAE J429 Grade 5 are acceptable.

For additional details see "Coupling Data Chart Notes" in the Introduction Section of the Gruvlok Catalog.
+ PN 16 uses M24 x 90 (PN) Dimensions for bolt circle PN 10 & 16 Flange.
* Available in ANSI or metric bolt sizes only as indicated.
▼ Based on use with standard wall pipe.
§ – For additional Bolt Torque information, see the Technical Data Section of the Gruvlok Catalog.
See Installation & Assembly directions on following pages.

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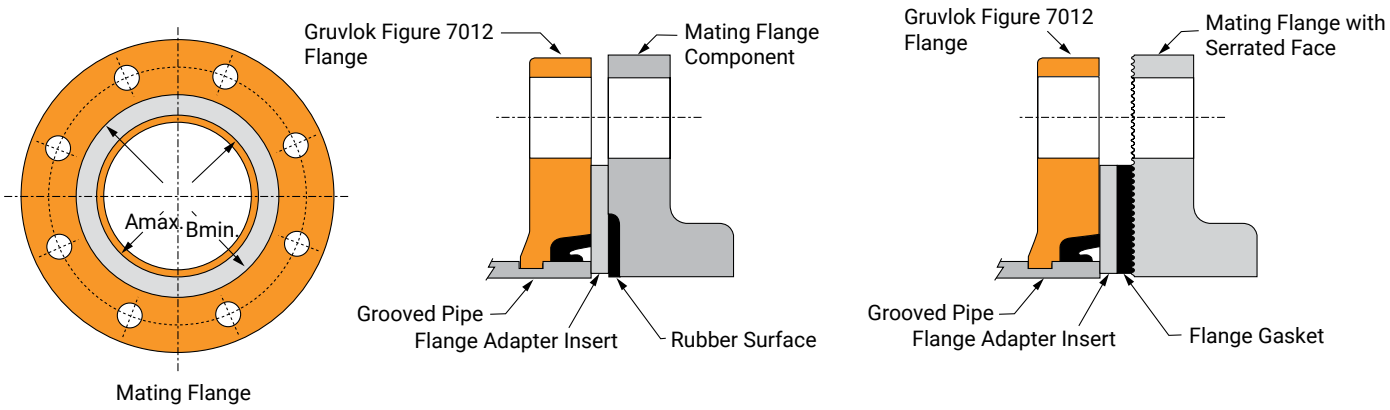
Gruvlok® Flanges
Fig. 7012



A. The sealing surfaces A Max. to B Min. of the mating flange must be free from gouges, undulations and deformities of any type to ensure proper sealing of the gasket.

B. Gruvlok Flanges are to be assembled on butterfly valves so as not to interfere with actuator or handle operation.

C. Do not use Gruvlok Flanges within 90 degrees of one another on standard fittings because the outside dimensions may cause interference.

D. Gruvlok Flanges should not be used as anchor points for tierods across non-restrained joints.

E. Fig. 7012 Gruvlok Flange sealing gaskets require a hard flat surface for adequate sealing. The use of a Gruvlok Flange Adapter Insert is required for applications against rubber faced valves or other equipment. The Gruvlok Flange Adapter Insert is installed between the Gruvlok Flange sealing gasket and the mating flange or surface to provide a good sealing surface area.

F. Gruvlok Flanges are not recommended for use against formed rubber flanges.

G. Contact an ASC Engineered Solutions™ Representative for Di-Electric Flange connections.

Applications which require Gruvlok Flange Adapter Insert

1. When mating to a wafer valve (lug valve), if the valve is rubber faced in the area designated by the sealing surface dimensions (A Max. to B Min.), place the Gruvlok Flange Adapter Insert between the valve and the Gruvlok flange.
2. When mating to a rubber-faced metal flange, the Gruvlok Flange Adapter Insert is placed between the Gruvlok Flange and the rubber-faced flange.
3. When mating to a serrated flange surface, a standard full-faced flange gasket is installed against the serrated flange face and the Gruvlok Flange Adapter Insert is placed between the Gruvlok Flange and the standard Flange gasket.
4. When mating to valves or other component equipment where the flange face has an insert, use procedure described in note 3.

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Fig. 7012 Gruvlok® Flange (2"–12")

WARNING

Read and understand all instructions before use.

Ensure system is drained and depressurized before installation or service.

Use appropriate personal protective equipment.

Failure to follow these instructions could result in serious personal injury and/or property damage.

Applications which require Gruvlok Flange Adapter Insert

1. When mating to a wafer valve (lug valve), if the valve is rubber faced in the area designated by the sealing surface dimensions (A Max. to B Min.), place the Gruvlok Flange Adapter Insert between the valve and the Gruvlok flange.
2. When mating to a rubber-faced metal flange, the Gruvlok Flange Adapter Insert is placed between the Gruvlok Flange and the rubber-faced flange.
3. When mating to a serrated flange surface, a standard full-faced flange gasket is installed against the serrated flange face and the Gruvlok Flange Adapter Insert is placed between the Gruvlok Flange and the standard Flange gasket.
4. When mating to valves or other component equipment where the flange face has an insert, use procedure described in note 3.

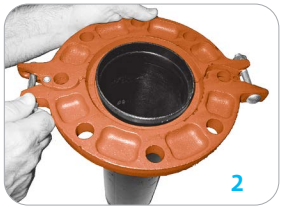
Check pipe end for proper grooved dimensions and to assure that the pipe end is free of indentations and projections that would prevent proper sealing of the Gruvlok flange gasket.

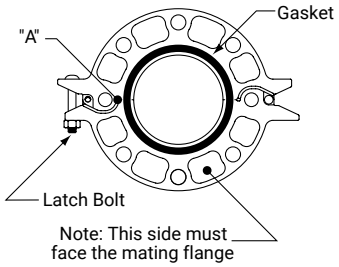
1 Install Housings

On the side without the hinge pin, loosen the latch bolt nut to the end of the bolt thread. (It is not necessary to remove the nut from the latch bolt.) Swing the latch bolt out of the slot. Open the Gruvlok Flange and place around the grooved pipe end with the key section fitting into the groove. The flange gasket cavity must face the pipe end.

2 Latch Housings

Place the latch bolt back into the slotted hole. Tighten the nut until there is a 1⁄16" gap between the flange halves at location "A". (See Figure below)





WARNING

The Gruvlok Flange gasket must be inserted so that the sealing lips face toward the pipe end and the mating flange. The lip of the gasket, sealing on the pipe, should not extend beyond the pipe end. The pipe should extend out beyond the end of the sealing lip by approximately 1⁄8" on the 2"–6" sizes and 3⁄16" on the 8"–12" sizes.

3 Check & Lubricate Gasket

Check the gasket to assure that it is properly suited for the intended service. Lubricate the entire exterior surface of the gasket, including the sealing lips, using the proper Gruvlok lubricant.

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Building connections that last™

Fig. 7012 Gruvlok® Flange (2"–12")

WARNING

Read and understand all instructions before use.

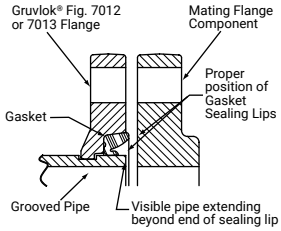
Ensure system is drained and depressurized before installation or service.

Use appropriate personal protective equipment.

Failure to follow these instructions could result in serious personal injury and/or property damage.

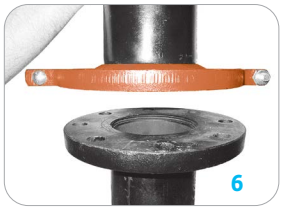
4 Install Gasket

Stretch the Gruvlok gasket around the pipe end and then press the gasket into the cavity between the pipe O.D. and the flange. The gasket must be properly positioned as shown in the figure below.



5 Lubricate Gasket Lip

With the gasket in place apply lubricant to the exposed gasket tip, which will seal on the mating flange. **Tighten the nuts on the latch bolts alternately to the specified latch bolt torque. The flange housings must be in firm metal-to-metal contact.**



6 Inspect Mating Flange

Verify that the mating flange face is hard, flat and smooth, free of indentations, which would prevent proper sealing of the Gruvlok Flange gasket. Assure the gasket is still in the proper position and align Gruvlok Flange bolt holes with the mating flange, pump, tank, etc., bolt holes.

7 Install Bolting

Insert a flange bolt or stud with material properties of SAE J429 Grade 5 or higher through the bolt holes and thread a nut on hand tight. Continue this procedure until all bolt holes have been fitted. Tighten the nuts alternately and evenly so the flange faces remain parallel. All the bolts or studs must be torqued to the mating flange bolts specified torque. The flange faces should have metal-to-metal contact.

Warning: It is important to line up the bolt holes before bringing the two flanges together. Sliding the flanges into place will dislodge the gasket and cause leakage to occur. When using a flange insert, it is important that the insert is properly aligned with the gasket prior to tightening the bolts.

Fig. C1 & C2

Note: The Gruvlok Fig. 7012 Flange requires the use of a Flange Adapter Insert when used against rubber surfaces (Figure C1), serrated flange surfaces or mating flanges with inserts (Figure C2). The Flange Adapter Insert will be exposed to the fluids in the system. Ensure that the Insert is compatible with the fluids in the systems and with adjacent piping components.

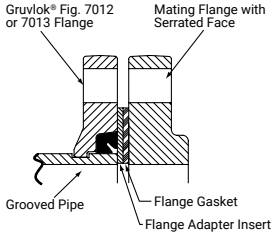


Fig. C1

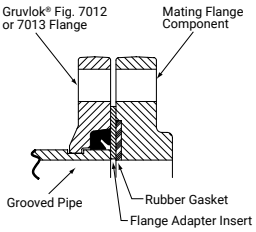


Fig. C2

Warning: Do not use a steel Flange Adapter Insert in copper systems or in systems where galvanic corrosion is possible.

Caution: Proper torquing of flange bolts is required to obtain specified performance. Over torquing the bolts may result in damage to the bolt and/or casting which could result in pipe joint separation. Under torquing the bolts may result in lower pressure retention capabilities, lower bend load capabilities, joint leakage and pipe joint separation. Pipe joint separation may result in significant property damage and serious injury.

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Fig. 7012 Gruvlok® Flange (14"–24")

WARNING

Read and understand all instructions before use.

Ensure system is drained and depressurized before installation or service.

Use appropriate personal protective equipment.

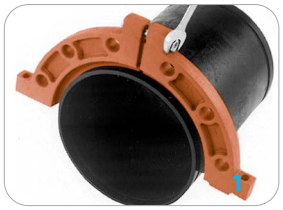
Failure to follow these instructions could result in serious personal injury and/or property damage.

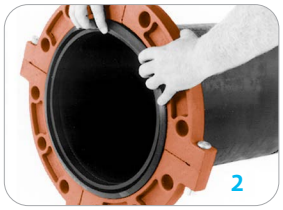
Gruvlok Flanges of 14" size and larger are cast in four segments to ease handling during assembly. Figure 7012 Gruvlok Flanges should not be used with tie rods in a configuration with a wafer valve between two 7012 flanges.

1 Install Housing

Place each Gruvlok Flange segment around the grooved pipe with the key section fitting into the groove and the flange gasket cavity facing the pipe end. Loosely assemble the segments using the four segment-bolts-and nuts. Alternately and equally tighten the latch bolts and nuts to the specified latch bolt torque. Bring the four flange segments into full, firm metal-to-metal contact.

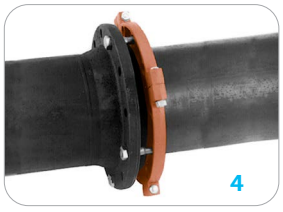
Note: An alternative method of assembly is to loosely preassemble two segments into two equal halves of the flange leaving a small gap (approximately 1/8") between the two segments of each flange-half. Place the flange halves around the pipe and complete the assembly as described in Step 1, above.





2 Install Gasket

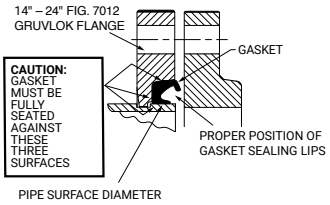
Check the gasket grade to verify that it is properly suited for the intended service. Lubricate the entire surface of the gasket and the flange cavity using the appropriate Gruvlok Lubricant. Place the Gruvlok Flange Gasket around the pipe end by pressing the gasket into the cavity between the pipe O.D. and flange recess. Move around the gasket in both directions until the gasket is fully seated in the flange gasket cavity.



3 Gasket Position

The correct position and relationship of the components of the Gruvlok Flange assembly is shown in the Figure above. The wide gasket lip must seal on the pipe surface diameter and the narrow gasket lip must face the mating flange. Be careful that foreign particles do not adhere to lubricated surfaces.

Note: Design of the Gruvlok Flange provides sealing only with the special Gruvlok Flange gasket. Only Gruvlok Flange gaskets may be used with Fig. 7012 flanges.



4 Inspect & Mate Flange

Align the Gruvlok Flange bolt holes with mating flange bolt holes. Insert a flange bolt or stud with material properties of SAE J429 Grade 5 or higher through the bolt holes and thread a nut on hand tight. Insert the next bolt or stub opposite the first and again thread the nut on hand tight. Continue this procedure until all bolt holes have been fitted. Insertion of the flange bolts prior to contact of the flanges will help in the alignment of the flanges. Pull the two flanges into contact using care to assure that the gasket remains fully seated within the gasket cavity during assembly.

Note: Take care to assure that the gasket lip is not bent backwards and pinched between the two flanges.

5 Install Bolting

Tighten the nuts evenly to the specified mating face bolt torque so that the flange faces remain parallel and make firm even contact around the entire flange.

Caution: Proper torquing of flange bolts is required to obtain specified performance. Over torquing the bolts may result in damage to the bolt and/or casting which could result in pipe joint separation. Under torquing the bolts may result in lower pressure retention capabilities, lower bend load capabilities, joint leakage and pipe joint separation. Pipe joint separation may result in significant property damage and serious injury.

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