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GRINNELL Mechanical Products Installation / Assembly Instructions, Flange Adapters

General Description

These installation instructions do not take the place of nor do they eliminate the need for the installer to fully read and understand the complete GRINNELL Mechanical Products Installation Handbook (refer to IH-1000M). Always review the GRINNELL Mechanical Products Installation Handbook and individual product Technical Data Sheets for the latest instructions, techniques, and care and maintenance information. Current documentation can be obtained by contacting GRINNELL Mechanical Products or visiting www.grinnell.com.

Installation Guidelines

NOTICE

The following instructions are a guideline for the proper installation of GRINNELL grooved products.

Always read and understand the instructions including the "Installation Guidelines" section in this document. Failure to follow these instructions may result in improper product installation, joint failure, leakage, serious personal injury, and/or property damage.

To avoid serious personal injury, wear safety glasses, hard hat and foot protection.

Never remove any piping component without verifying that the system is depressurized and drained. Failure to do so may result in serious personal injury.

The pipe groove dimensions must be in accordance with Standard Cut Groove or Roll Groove Specifications. Refer to Technical Data Sheet G710 for more information.

IMPORTANT

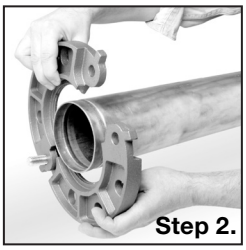
Refer to Technical Data Sheet G1100 for warnings pertaining to regulatory and health information.

Torque values are supplied as a guideline and may be used when setting the torque on power impact wrenches. Always refer to the power impact wrench manufacturer's instructions for settings.

Flange Adapter (2 in. - 12 in.)
Figure 71
Installation / Assembly Instructions

The following instructions apply to the Figure 71 Flange Adapter. For more information refer to Technical Data Sheet G150 (Figure 71). The installation is based on pipe grooved in accordance with Standard Cut Groove or Roll Groove Specifications. Refer to Technical Data Sheet G710 for Steel Pipe.

Step 1. Inspect exterior groove and ends of the pipe to verify all burrs, loose debris, dirt, chips, paint and any other foreign material such as grease are removed. Pipe end sealing surfaces must be free from sharp edges, projections, indentations, and/or other defects.


Step 2.

Step 2. Verify that the gasket selection is correct for the application intended. Refer to Technical Data Sheet G610 for additional gasket information.

Insert one flange bolt (not supplied) in the hinge section of Flange Adapter. Place the hinged assembly into the groove on the pipe.


Step 3.

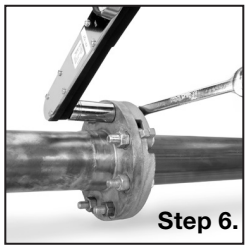
Step 3. Close the flange with another bolt. To ease in the closure of the Flange Adapter, two tabs are provided. Take an adjustable wrench and place it over the two tabs as shown. Move the wrench parallel to the pipe until the holes align. Once the holes align, insert a bolt. Verify that the housing keys are fully engaged into the groove.


Step 4.

Step 4. The sealing edges and outer surfaces of the gasket should be covered with a fine layer of lubricant. To prevent deterioration of the gasket material, a petroleum lubricant should never be used on Grade "E" "EPDM". For assembly below 40°F (4°C) a petroleum-free silicone lubricant must be used to prevent freezing of the lubricant.


Step 5.

Step 5. Place the gasket into the gasket pocket with the gasket marking side in first.


Step 6.

Step 6. Bring both the Flange Adapter and the opposite Flange together. Ensure proper alignment and slide each of the remaining flange bolts (not supplied) in the remaining bolt holes. Tighten all nuts uniformly in an alternating pattern to the recommended bolt torque in Table A.

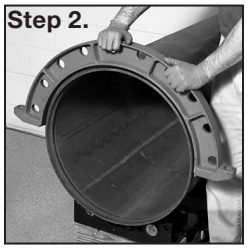
Flange Washer Adapters are required when the Flange Adapters are used against surfaces such as:

- Rubber surfaces
- Adapting to AWWA cast flanges
- Rubber faced wafer valves
- Serrated flange surfaces

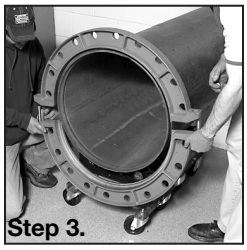
Flange Adapters are not recommended for applications that incorporate tie rods for anchoring, or on standard fittings within 90° of each other.

Flange Adapter (14 in. - 24 in.)
Figure 71 (Large Diameter)
Installation / Assembly Instructions
The installation is based on pipe grooved in accordance with Standard Cut Groove or Roll Groove Specifications. Refer to Technical Data Sheet G710 for more information.

Step 1. Inspect exterior groove and ends of the pipe to verify all burrs, loose debris, dirt, chips, paint and any other foreign material such as grease are removed. Pipe end sealing surfaces must be free from sharp edges, projections, indentations, and/or other defects.

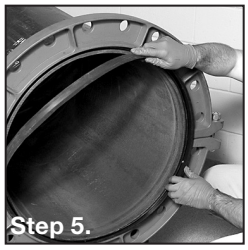


Step 2. Place the first segment of the assembly into the groove on the pipe.



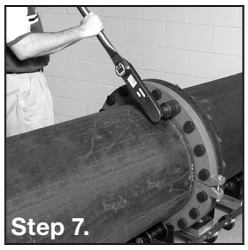
Step 3. Bring the second half of the flange assembly together into the groove of the pipe. Insert the two coupling bolts into the bolt pads and tighten the nuts, drawing the pads together but allowing the housings to remain loose enough to permit the flange adapter to be rotated for bolt hole alignment in Step 6. Verify that the housing keys are fully engaged into the groove.

Step 4. Verify that the gasket selection is correct for the application intended (refer to Technical Data Sheet G610 for additional information). The sealing edges and outer surfaces of the gasket should be covered with a fine layer of lubricant. To prevent deterioration of the gasket material a petroleum lubricant should never be used on Grade “E” “EPDM”. For assembly below 40°F (4°C) a petroleum-free silicone lubricant is recommended.



Step 5. Place the gasket into the gasket pocket with the gasket marking side in first.

Step 6. Rotate the Flange Adapter to align the bolt holes with the mating flange. Tightening nuts uniformly to the recommended bolt torque, refer to Table B, to bring bolt pads into metal to metal contact.



Step 7. Bring both the Flange Adapter and the mating flange together. Ensure proper bolt hole alignment. Slide a flange bolt through the bolt holes and thread a nut on hand tight. Continue this procedure until all flange bolts have been inserted. Tighten the flange bolts and nuts uniformly to the specified mating face bolt torque (refer to Table C). Ensure that the flange faces remain parallel and make contact around the full circumference of the flange face.

Figure 71 Flange Adapters are not recommended for applications that incorporate tie rods for anchoring, or on standard fittings within 90° of each other.

For more information refer to Technical Data Sheet G150.

Nominal Pipe Size		Recommended Flange Mating Bolts[1] Use ANSI Bolts for Class 125/150 Flanges Use Metric Bolts for PN10 and PN16 flanges		
ANSI Inch DN	O.D. Inch (mm)	Size Dia. X Lg. Inches (metric)	Qty.	Bolt Torque Range lb-ft (N·m)
2 DN50	2.375 (60,3)	5/8 x 3 M16 x 76	4	110–140 (149–190)
2-1/2 DN65	2.875 (73,0)	5/8 x 3 M16 x 76	4	
— DN65	3.00 (76,1)	5/8 x 3 M16 x 76	4	
3 DN80	3.50 (88,9)	5/8 x 3 M16 x 76	4[2]	
4 DN100	4.50 (114,3)	5/8 x 3 M16 x 76	8	
— DN125	5.50 (139,7)	3/4 x 3-1/2 M20 x 89	8	220–250 (298–339)
5 DN125	5.563 (141,3)	3/4 x 3-1/2 M20 x 89	8	220–250 (298–339)
— DN150	6.50 (165,1)	3/4 x 3-1/2 M20 x 89	8	
6 DN150	6.625 (168,3)	3/4 x 3-1/2 M20 x 89	8	
8 DN200	8.625 (219,1)	3/4 x 3-1/2 M20 x 89	8[3]	
10 DN250	10.75 (273,1)	7/8 x 4 M22 x 102	12	320–400 (434–542)
12 DN300	12.75 (323,9)	7/8 x 4 M22 x 102	12	

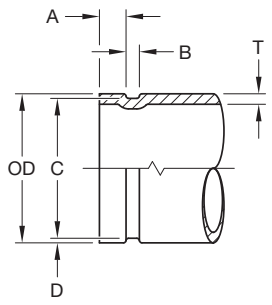
NOTES
1. Mating Bolts and Nuts are not supplied. Flange Mating Bolts must be at least SAE J429 Grade 5 or stronger. Bolt lengths are standard; it is the responsibility of the purchaser to verify correct length for the intended application.
2. PN16 features 8 bolts
3. PN16 features 12 bolts

TABLE A
FIGURE 71 FLANGE ADAPTERS
2 INCH – 12 INCH (DN50 – DN12)
RECOMMENDED MATING BOLT DATA

Nominal Pipe Size		Recommended Flange Mating Bolts[1]			Segment Bolts	
ANSI Inch DN	O.D. Inches (mm)	Size Dia. x Lg. Inches	Qty.	Bolt Torque Range lb-ft (N·m)	Size Dia. x Lg. Inches	Bolt Torque Range lb-ft (N·m)
14 DN350	14.00 (355,6)	1 x 4-1/4	12	360–520 (488–705)	5/8 x 4-3/4	100–130 (488–705)
16 DN400	16.00 (406,4)	1 x 4-1/4	16	360–520 (488–705)		
18 DN450	18.00 (457,2)	1-1/8 x 4-3/4	16	450–725 (610–982)	3/4 x 4-3/4	130–180 (841–1356)
20 DN500	20.00 (508,0)	1-1/8 x 4-3/4	20	450–725 (610–982)		
24 DN600	24.00 (609,6)	1-1/4 x 5-1/2	20	620–1000 (841–1356)		

NOTES
1. Mating Bolts and Nuts are not supplied. Flange Mating Bolts must be at least SAE J429 Grade 5 or stronger. Bolt lengths are standard; it is the responsibility of the purchaser to verify correct length for the intended application.

TABLE B
FIGURE 71 FLANGE ADAPTERS
14 INCH – 24 INCH (DN350 – DN600)
RECOMMENDED MATING BOLT DATA



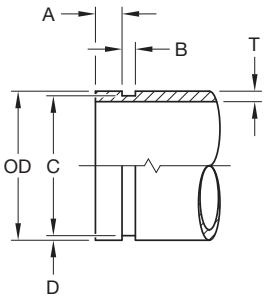
- The maximum allowable tolerances for IPS Pipe from square cut ends are:

For sizes 1¼ in. to 3 in. (DN32 to DN80)	For sizes 4 in. to 6 in. (DN100 to DN150)	For sizes 8 in. (DN200) and greater
0.030 in. (0,76mm)	0.045 in. (1,14mm)	0.060 in. (1,52mm)

- Gasket Seating Surface "A" must be free from score marks, ridges, indentations, projections, loose paint, scale, dirt chips, grease, rust, etc. that would prevent a positive seal.
- Groove Diameter "C" must be uniform depth around the circumference of the pipe.
- Groove Depth "D" is a reference dimension only. The Groove Diameter "C" must be maintained.
- Minimum Wall Thickness "T" is the minimum pipe wall thickness that should be roll grooved.
- Maximum allowable pipe end flare diameter is measured at the pipe end diameter (Roll Grooved Pipe only).

Nominal Pipe Size ANSI Inches DN	Pipe O.D. Inches (mm)	Pipe O.D. Tolerance Inches (mm)		A Inches (mm) Tol. ±0.030 (±0,76)	B Inches (mm) Tol. ±0.030 (±0,76)	C Groove Diameter Inches (mm)		D Nominal Groove Depth Inches (mm)	T Minimum Wall Inches (mm)	Maximum Flare Diameter Inches (mm)
		+	-			Actual	Tol. +0.000			
2 DN50	2.375 (60,3)	0.024 (0,61)	0.024 (0,61)	0.625 (15,88)	0.344 (8,74)	2.250 (57,15)	-0.015 (-0,38)	0.062 (1,60)	0.065 (1,65)	2.48 (62,99)
2-1/2 DN65	2.875 (73,0)	0.029 (0,74)	0.029 (0,74)	0.625 (15,88)	0.344 (8,74)	2.720 (69,09)	-0.018 (-0,46)	0.078 (1,98)	0.083 (2,11)	2.98 (75,69)
– DN65	3.000 (76,1)	0.030 (0,76)	0.030 (0,76)	0.625 (15,88)	0.344 (8,74)	2.845 (72,26)	-0.018 (-0,46)	0.076 (1,93)	0.083 (2,11)	3.10 (78,74)
3 DN80	3.500 (88,9)	0.035 (0,89)	0.031 (0,79)	0.625 (15,88)	0.344 (8,74)	3.344 (84,94)	-0.018 (-0,46)	0.078 (1,98)	0.083 (2,11)	3.60 (91,44)
4 DN100	4.500 (114,3)	0.045 (1,14)	0.031 (0,79)	0.625 (15,88)	0.344 (8,74)	4.334 (110,08)	-0.020 (-0,51)	0.083 (2,11)	0.083 (2,11)	4.60 (116,84)
– DN125	5.500 (139,7)	0.056 (1,42)	0.031 (0,79)	0.625 (15,88)	0.344 (8,74)	5.334 (135,48)	-0.022 (-0,56)	0.083 (2,11)	0.109 (2,77)	5.60 (142,24)
5 DN125	5.563 (141,3)	0.056 (1,42)	0.031 (0,79)	0.625 (15,88)	0.344 (8,74)	5.395 (137,03)	-0.022 (-0,56)	0.084 (2,13)	0.109 (2,77)	5.66 (143,76)
– DN150	6.500 (165,1)	0.063 (1,60)	0.031 (0,79)	0.625 (15,88)	0.344 (8,74)	6.330 (160,78)	-0.022 (-0,56)	0.085 (2,16)	0.109 (2,77)	6.60 (167,64)
6 DN150	6.625 (168,3)	0.063 (1,60)	0.031 (0,79)	0.625 (15,88)	0.344 (8,74)	6.455 (163,96)	-0.022 (-0,56)	0.085 (2,16)	0.109 (2,77)	6.73 (170,94)
8 DN200	8.625 (219,1)	0.063 (1,60)	0.031 (0,79)	0.750 (19,05)	0.469 (11,91)	8.441 (214,40)	-0.025 (-0,64)	0.092 (2,34)	0.109 (2,77)	8.80 (223,52)
10 DN250	10.750 (273,0)	0.063 (1,60)	0.031 (0,79)	0.750 (19,05)	0.469 (11,91)	10.562 (268,27)	-0.027 (-0,69)	0.094 (2,39)	0.134 (3,40)	10.92 (277,37)
12 DN300	12.750 (323,9)	0.063 (1,60)	0.031 (0,79)	0.750 (19,05)	0.469 (11,91)	12.531 (318,19)	-0.030 (-0,76)	0.109 (2,77)	0.156 (3,96)	12.92 (328,17)
14 DN350	14.000 (355,6)	0.063 (1,60)	0.031 (0,79)	0.938 (23,83)	0.469 (11,91)	13.781 (350,04)	-0.030 (-0,76)	0.109 (2,77)	0.156 (3,96)	14.10 (358,14)
16 DN400	16.000 (406,4)	0.063 (1,60)	0.031 (0,79)	0.938 (23,83)	0.469 (11,91)	15.781 (400,84)	-0.030 (-0,76)	0.109 (2,77)	0.165 (4,19)	16.10 (408,94)
18 DN450	18.000 457.2	0.063 (1,60)	0.031 (0,79)	1.000 (25,40)	0.469 (11,91)	17.781 (451,64)	-0.030 (-0,76)	0.109 (2,77)	0.165 (4,19)	18.16 (461,26)
20 DN500	20.000 (508,0)	0.063 (1,60)	0.031 (0,79)	1.000 (25,40)	0.469 (11,91)	19.781 (502,44)	-0.030 (-0,76)	0.109 (2,77)	0.188 (4,78)	20.16 (512,06)
24 DN600	24.000 (609,6)	0.063 (1,60)	0.031 (0,79)	1.000 (25,40)	0.500 (12,70)	23.656 (600,86)	-0.030 (-0,76)	0.172 (4,37)	0.218 (5,54)	24.20 (614,68)

TABLE C
STANDARD ROLL GROOVE STEEL PIPE SPECIFICATIONS



• The maximum allowable tolerances for IPS Pipe from square cut ends are:		
For sizes 1¼ in. to 3 in. (DN32 to DN80)	For sizes 4 in. to 6 in. (DN100 to DN150)	For sizes 8 in. (DN200) and greater
0.030 in. (0,76mm)	0.045 in. (1,14mm)	0.060 in. (1,52mm)
• Gasket Seating Surface "A" must be free from score marks, ridges, indentations, projections, loose paint, scale, dirt chips, grease, rust, etc. that would prevent a positive seal.		
• Groove Diameter "C" must be uniform depth around the circumference of the pipe.		
• Groove Depth "D" is a reference dimension only. The Groove Diameter "C" must be maintained.		
• Minimum Wall Thickness "T" is the minimum wall thickness that should be cut grooved.		

Nominal Pipe Size ANSI Inches DN	Pipe O.D. Inches (mm)	Pipe O.D. Tolerance Inches (mm)		A Inches (mm) Tol. ±0.030 (±0,76)	B Inches (mm) Tol. ±0.030 (±0,76)	C Groove Diameter Inches (mm)		D Nominal Groove Depth Inches (mm)	T Minimum Wall Inches (mm)
		+	-			Actual	Tol. +0.000		
2 DN50	2.375 (60,3)	0.024 (0.61)	0.024 (0.61)	0.625 (15,88)	0.313 (7,95)	2.250 (57,15)	-0.015 (-0,38)	0.062 (1,60)	0.154 (3,91)
2-1/2 DN65	2.875 (73,0)	0.029 (0,74)	0.029 (0,74)	0.625 (15,88)	0.313 (7,95)	2.720 (69,09)	-0.018 (-0,46)	0.078 (1,98)	0.188 (4,78)
– DN65	3.000 (76,1)	0.030 (0,76)	0.030 (0,76)	0.625 (15,88)	0.313 (7,95)	2.845 (72,26)	-0.018 (-0,46)	0.076 (1,93)	0.188 (4,78)
3 DN80	3.500 (88,9)	0.035 (0,89)	0.031 (0,79)	0.625 (15,88)	0.313 (7,95)	3.344 (84,94)	-0.018 (-0,46)	0.078 (1,98)	0.188 (4,78)
4 DN100	4.500 (114,3)	0.045 (1,14)	0.031 (0,79)	0.625 (15,88)	0.375 (9,53)	4.334 (110,08)	-0.020 (-0,51)	0.083 (2,11)	0.203 (5,16)
– DN125	5.500 (139,7)	0.056 (1,42)	0.031 (0,79)	0.625 (15,88)	0.375 (9,53)	5.334 (135,48)	-0.022 (-0,56)	0.083 (2,11)	0.203 (5,16)
5 DN125	5.563 (141,3)	0.056 (1,42)	0.031 (0,79)	0.625 (15,88)	0.375 (9,53)	5.395 (137,03)	-0.022 (-0,56)	0.084 (2,13)	0.203 (5,16)
– DN150	6.500 (165,1)	0.063 (1,60)	0.031 (0,79)	0.625 (15,88)	0.375 (9,53)	6.330 (160,78)	-0.022 (-0,56)	0.085 (2,16)	0.219 (5,56)
6 DN150	6.625 (168,3)	0.063 (1,60)	0.031 (0,79)	0.625 (15,88)	0.375 (9,53)	6.455 (163,96)	-0.022 (-0,56)	0.085 (2,16)	0.219 (5,56)
8 DN200	8.625 (219,1)	0.063 (1,60)	0.031 (0,79)	0.750 (19,05)	0.438 (11,13)	8.441 (214,40)	-0.025 (-0,64)	0.092 (2,34)	0.238 (6,05)
10 DN250	10.750 (273,0)	0.063 (1,60)	0.031 (0,79)	0.750 (19,05)	0.500 (12,70)	10.562 (268,27)	-0.027 (-0,69)	0.094 (2,39)	0.250 (6,35)
12 DN300	12.750 (323,9)	0.063 (1,60)	0.031 (0,79)	0.750 (19,05)	0.500 (12,70)	12.531 (318,19)	-0.030 (-0,76)	0.109 (2,77)	0.279 (7,09)
14 DN350	14.000 (355,6)	0.063 (1,60)	0.031 (0,79)	0.938 (23,83)	0.500 (12,70)	13.781 (350,04)	-0.030 (-0,76)	0.109 (2,77)	0.281 (7,14)
16 DN400	16.000 (406,4)	0.063 (1,60)	0.031 (0,79)	0.938 (23,83)	0.500 (12,70)	15.781 (400,84)	-0.030 (-0,76)	0.109 (2,77)	0.312 (7,92)
18 DN450	18.000 (457,2)	0.063 (1,60)	0.031 (0,79)	1.000 (25,40)	0.500 (12,70)	17.781 (451,64)	-0.030 (-0,76)	0.109 (2,77)	0.312 (7,92)
20 DN500	20.000 (508,0)	0.063 (1,60)	0.031 (0,79)	1.000 (25,40)	0.500 (12,70)	19.781 (502,44)	-0.030 (-0,76)	0.109 (2,77)	0.312 (7,92)
24 DN600	24.000 (609,6)	0.063 (1,60)	0.031 (0,79)	1.000 (25,40)	0.562 (14,27)	23.656 (600,86)	-0.030 (-0,76)	0.172 (4,37)	0.375 (9,53)

TABLE D
STANDARD CUT GROOVE STEEL PIPE SPECIFICATIONS

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Johnson Controls