

## Grinnell Mechanical Products Installation / Assembly Instructions, Couplings

### 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 tech 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". 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.

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.

#### IMPORTANT

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

Exceeding the suggested torque values may cause damage to the coupling and/or result in pipe-joint failure. Minimum bolt torque is required for the coupling to meet the published performance parameters.

#### Couplings (1 in. - 24 in.) Figures 772, 577, 472, 705, 707, 405, and 774

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.** Verify that the coupling and gasket grade are correct for the application intended. Refer to tech data sheet G610 for additional gasket information.

For dry pipe and freezer applications, use the EPDM Tri-Seal freezer gasket with a petroleum free silicone lubricant is recommended. Reducing Couplings are not recommended for freezer applications.

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. Silicone based lubricant should not be used on Grade "L" silicone gaskets.

#### For Flexible Couplings Only:

Figures 705, 707, and 405 Coupling Housing bolt pads must be in metal to metal contact. For Flexible Coupling deflection data refer to individual tech data sheets.

#### For Rigid Couplings Only:

Figure 772, 577, 472, and 774 Rigid Couplings have an intended gap of up to 1/16 of an inch at each pad to

Bolt Size ANSI Inches	Bolt Torque Range lb-ft
3/8	30-40
1/2	90-110
5/8 <sup>a</sup>	100-130
3/4	150-200
7/8	180-220
1	200-250
1-1/8	225-275

Bolt Size Metric	Bolt Torque Range N-m
M10	40-60
M12	120-150
M16 <sup>a</sup>	135-175
M20	200-270
M22	245-300
M24	270-340

#### NOTES

a. For 8 in. Figure 577, the bolt torque range is 150 to 180 lb-ft for a 5/8 in. bolt (200 to 245 N-m for an M16 bolt).

**TABLE A  
BOLT TORQUE SPECIFICATIONS**

Coupling Type	Coupling Figure Number	Data Sheet Number
Rigid	Figure 772	G140, G141
Rigid	Figure 577	TFP1854
Rigid	Figure 472	G560
Rigid	Figure 774	G142
Flexible	Figure 705	G110
Flexible	Figure 707	G130
Flexible	Figure 405	G565

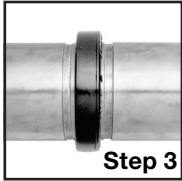
**TABLE B  
COUPLING DATA SHEET NUMBERS**

allow for positive rigid gripping onto the pipe. The patented tongue and groove design provides protection to the back of the gasket during installation.

**Couplings (1 in. to 12 in.)**

**Figures 772, 577, 472, 705, 707, 405, and 774**

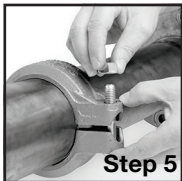
Perform **Steps 1 and 2** from Couplings (1 in. - 24 in.) section prior to continuing with the following procedure.



**Step 3.** Install the gasket by placing it over the pipe so that the gasket lip does not extend beyond the end of the pipe. Bring both pipe ends together ensuring vertical and horizontal alignment. Slide the gasket into position centering it between the grooves of each pipe end.



**Step 4.** With one nut and bolt removed, “swing” the coupling housing over the gasket. Verify that the housings are over the gasket and that the housing keys are fully engaged into the grooves.



**Step 5.** Insert the other bolt and nut into the coupling and rotate both nuts until finger tight. Verify that the bolt heads are fully recessed in the housing.



**Step 6.** Tighten nuts uniformly to the recommended bolt torque per Table A. Uneven tightening can cause the gasket to pinch or bind.

**Couplings (14 in. - 24 in.)  
Figure 772 and 707 (Large Diameter)**

EDPM Tri-Seal gaskets are recommended for applications below 40°F (4°C).

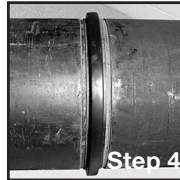
**Installation / Assembly Instructions**

The following instructions apply to the 3 segment and 4 segment configurations for the Figure 772 (G140) Rigid Couplings, and the Figure 707 (G130) Heavy Duty Flexible Couplings. For additional information refer to the individual tech data sheet. 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.

Perform **Steps 1 and 2** from Couplings (1 in. - 24 in.) section prior to continuing with the following procedure.



**Step 3.** Install the gasket by placing it over the end of the first pipe section. For larger pipe diameters, it may be easier to roll the gasket inside out, then on to the pipe end. Ensure that the gasket does not extend beyond the end of the pipe.



**Step 4.** Bring both pipe ends together, ensure proper alignment and slide the gasket into position. (If gasket was turned inside out per step 3 roll the gasket over into position.) Center it between the grooved portions of each pipe.

The gasket should not protrude into the grooves on either pipe segment or extend between the pipe ends.

**Step 5.** Place the assembly over the gasket and verify that the housing keys are fully engaged into the pipe grooves.



**Step 6.** Assemble two sections of the housing by inserting a bolt into the coupling and loosely engaging the nut. (For four segment couplings it may be easier to assemble two halves first.)



**Step 7.** Bring the next section of the housing into position. Insert a bolt into the coupling and finger tighten the nut.



**Step 8.** Tighten nuts uniformly to the recommended bolt torque per Table A.

**Flexible Reducing Coupling**

**Figure 716**

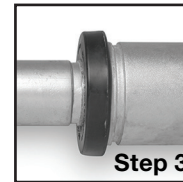
Reducing Couplings are not recommended for applications below 40°F (4°C).

**Installation / Assembly Instructions**

The following instructions apply to Figure 716 Flexible Reducing Couplings. Refer to the Technical Data Sheet G120 for more information.

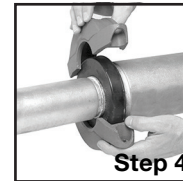
GRINNELL Reducing Couplings, when properly installed, will have pad to pad contact between the housings. Use an optional Type 304 metal insert to prevent pipe telescoping when installing the Figure 716 in the vertical position. Prior to **Step 2** place the insert inside the gasket aligning the insert slots with the ribs on the gasket.

Perform **Steps 1 and 2** from Couplings (1 in. - 24 in.) section prior to continuing with the following procedure.

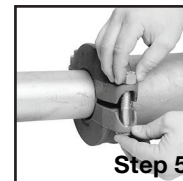


**Step 3.** Install the gasket by placing the gasket over the pipe that has the larger diameter. Bring the smaller pipe end into alignment and slide the pipe into position. Slide the gasket into position, properly centering it between the grooved portions of each pipe.

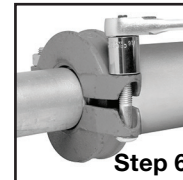
The gasket should not protrude into the grooves on either pipe segment.



**Step 4.** With both bolts removed, place the coupling housings over the gasket. Verify that the housings are over the gasket and that the housing keys are fully engaged into the pipe grooves.

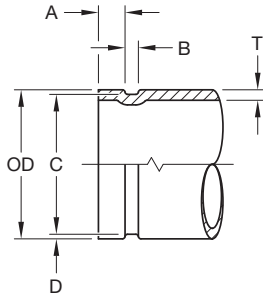


**Step 5.** Insert the bolts into the coupling and rotate the nuts until finger tight. Verify that the bolt heads are fully recessed in the housing.



**Step 6.** Tighten nuts uniformly to the recommended bolt torque per Table A.

Always tighten the nut and bolt set evenly. Uneven tightening can cause the gasket to pinch or bind.

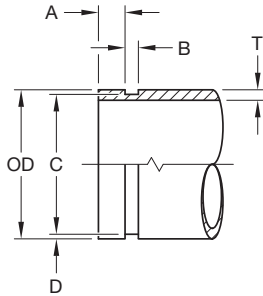


- The maximum allowable tolerances for IPS Pipe from square cut ends are:  

For sizes 1/4 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			
1 DN25	1.315 (33,7)	0.015 (0,38)	0.015 (0,38)	0.625 (15,88)	0.281 (7,14)	1.190 (30,22)	-0.015 (-0,38)	0.062 (1,60)	0.065 (1,65)	1.36 (34,54)
1-1/4 DN32	1.660 (42,4)	0.016 (0,41)	0.016 (0,41)	0.625 (15,88)	0.281 (7,14)	1.535 (38,99)	-0.015 (-0,38)	0.062 (1,60)	0.065 (1,65)	1.77 (44,96)
1-1/2 DN40	1.900 (48,3)	0.019 (0,48)	0.019 (0,48)	0.625 (15,88)	0.281 (7,14)	1.775 (45,09)	-0.015 (-0,38)	0.062 (1,60)	0.065 (1,65)	2.01 (51,05)
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)
- DN100	4.250 (108,0)	0.043 (1,09)	0.031 (0,79)	0.625 (15,88)	0.344 (8,74)	4.084 (103,73)	-0.020 (-0,51)	0.083 (2,11)	0.083 (2,11)	4.35 (110,49)
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	5.250 (133,4)	0.053 (1,35)	0.031 (0,79)	0.625 (15,88)	0.344 (8,74)	5.084 (129,13)	-0.022 (-0,56)	0.083 (2,11)	0.109 (2,77)	5.35 (135,89)
- 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	6.250 (159,0)	0.063 (1,60)	0.031 (0,79)	0.625 (15,88)	0.344 (8,74)	6.084 (154,53)	-0.030 (-0,76)	0.083 (2,11)	0.109 (2,77)	6.35 (161,29)
- 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)
- DN200	8.516 (216,3)	0.063 (1,60)	0.031 (0,79)	0.750 (19,05)	0.469 (11,91)	8.331 (211,61)	-0.025 (-0,64)	0.092 (2,34)	0.109 (2,77)	8.69 (220,73)
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		
1 DN25	1.315 (33,7)	0.015 (0,38)	0.015 (0,38)	0.625 (15,88)	0.313 (7,95)	1.190 (30,23)	-0.015 (-0,38)	0.062 (1,60)	0.133 (3,38)
1-1/4 DN32	1.660 (42,4)	0.016 (0,41)	0.016 (0,41)	0.625 (15,88)	0.313 (7,95)	1.535 (38,99)	-0.015 (-0,38)	0.062 (1,60)	0.140 (3,56)
1-1/2 DN40	1.900 (48,3)	0.019 (0,48)	0.019 (0,48)	0.625 (15,88)	0.313 (7,95)	1.775 (45,09)	-0.015 (-0,38)	0.062 (1,60)	0.145 (3,68)
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)
- DN100	4.250 (108,0)	0.042 (1,07)	0.031 (0,79)	0.625 (15,88)	0.375 (9,53)	4.084 (103,73)	-0.020 (-0,51)	0.083 (2,11)	0.203 (5,16)
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	5.250 (133,4)	0.052 (1,35)	0.031 (0,79)	0.625 (15,88)	0.375 (9,53)	5.084 (129,13)	-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	6.250 (159,0)	0.063 (1,60)	0.031 (0,79)	0.625 (15,88)	0.375 (9,53)	6.084 (154,53)	-0.022 (-0,56)	0.083 (2,11)	0.219 (5,56)
- 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)
- DN200	8.516 (216,3)	0.063 (1,60)	0.031 (0,79)	0.750 (19,05)	0.438 (11,13)	8.331 (211,61)	-0.025 (-0,64)	0.092 (2,34)	0.238 (6,05)
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**