

## PIPE PREPARATION FOR MECHANICAL BRANCHLETS

Cut or drill the hole in pipe. Hole diameter for each size is listed in Table. Holes must be drilled on centerline of pipe. Remove the cut piece and cutting chips. Check pipe surface within 5/8" of the hole. This surface must be clean, smooth and free from indentation or projection, which would affect proper sealing. The pipe around entire circumference within the 'W' dimension must be free from any dirt and scale, which might affect sealing performance on the pipe surface (See Table).

# PIPE GROOVING SPECIFICATIONS



1	2		3	4		5		6 7		7	8	
	Pipe Outside Diameter		Gasket	Groove width		Groove Diameter		Groove	Min. A	llowable	Max.	
Nominal		OD		Seat	+ 0.03	0/+0.79	C		(Rof)	wall Thickness		Allowable
Size		in./mm		A	in./mm		in./mm		(Rel.)	in.	/mm	Flare
	Actual	Tolor	2000	In./mm	Roll	Cut	Actual	Toler.	U	Roll	Cut	Dia.
	Size	Iolei	ance	+ 0.030	Groove	Groove	Size	+0.000	in./mm	Groove	Groove	in./mm
	1 3 1 5	+0.013	-0.013	0.625	0.281	0 313	1 1 9 0	-0.015	0.063	0.065	0 133	1.43
1"	33.4	+0.33	-0.33	15.88	7.14	7.95	30.23	-0.38	1.60	1.65	3.38	36.3
	1 660	+0.016	-0.016	0.625	0.281	0.313	1.535	-0.015	0.063	0.065	0.140	1.77
1 1/4"	42.2	+0.41	-0.41	15.88	7.14	7.95	38.99	-0.38	1.60	1.65	3.56	45.0
4.470	1.900	+0.019	-0.019	0.625	0.281	0.313	1.775	-0.015	0.063	0.065	0.145	2.01
1 1/2"	48.3	+0.48	-0.48	15.88	7.14	7.95	45.09	-0.38	1.60	1.65	3.68	51.1
2"	2.375	+0.024	-0.024	0.625	0.344	0.313	2.250	-0.015	0.063	0.065	0.154	2.48
2	60.3	+0.61	-0.61	15.88	8.74	7.95	57.15	-0.38	1.60	1.65	3.91	63.0
2 1/2"	2.875	+0.029	-0.029	0.625	0.344	0.313	2.720	-0.018	0.078	0.083	0.188	2.98
- 1/2	73.0	+0.74	-0.74	15.88	8.74	7.95	69.09	-0.46	1.98	2.11	4.78	75.7
3" OD	3.000	+0.030	-0.030	0.625	0.344	0.313	2.845	-0.018	0.078	0.083	0.188	3.10
	76.1	+0.76	-0.76	15.88	8.74	7.95	72.26	-0.46	1.98	2.11	4.78	/8.7
3"	3.500	+0.035	-0.031	0.625	0.344	0.313	3.344	-0.018	0.078	0.083	0.188	3.60
	00.9	+0.89	-0.79	15.00	0.74	7.95	64.94	-0.46	0.000	2.11	4.70	91.4
4"	4.500	+0.045	-0.031	0.625	0.344	0.375	4.334	-0.020	0.083	0.083	0.203	4.60
	5 562	+0.056	0.021	0.625	0.244	0.275	5 205	-0.072	0.084	0.109	0.203	5.66
5"	141 3	+1.42	-0.79	15.88	8.74	9.53	137.03	-0.022	2 13	2.77	5.16	143.8
5 4 31 35	5 500	+0.056	-0.031	0.625	0.344	0.375	5 334	-0.020	0.083	0.109	0 203	5.60
5 1/2" OD	139.7	+1.42	-0.79	15.88	8.74	9.53	135.48	-0.51	2.11	2.77	5.16	142.2
	6,000	+0.056	-0.031	0.625	0.344	0.375	5.830	-0.022	0.085	0.109	0.219	6.10
6"OD	152.4	+1.42	-0.79	15.88	8.74	9.53	148.08	-0.56	2.16	2.77	5.56	154.9
C.I.	6.625	+0.063	-0.031	0.625	0.344	0.375	6.455	-0.022	0.085	0.109	0.219	6.73
6.	168.3	+1.60	-0.79	15.88	8.74	9.53	163.96	-0.56	2.16	2.77	5.56	170.9
6 1/2" OD	6.500	+0.063	-0.031	0.625	0.344	0.375	6.330	-0.022	0.085	0.109	0.219	6.60
0 1/2 00	165.1	+1.60	-0.79	15.88	8.74	9.53	160.78	-0.56	2.16	2.77	5.56	167.6
Q"	8.625	+0.063	-0.031	0.750	0.469	0.438	8.441	-0.025	0.092	0.109	0.238	8.80
0	219.1	+1.60	-0.79	19.05	11.91	11.13	214.40	-0.64	2.34	2.77	6.05	223.5
10"	10.750	+0.063	-0.031	0.750	0.469	0.500	10.562	-0.027	0.094	0.134	0.250	10.92
	273.0	+1.60	-0.79	19.05	11.91	12.70	268.28	-0.69	2.39	3.40	6.35	277.4
12"	12.750	+0.063	-0.031	0.750	0.469	0.500	12.531	-0.030	0.109	0.156	0.279	12.92
105-1	323.9	+1.60	-0.79	19.05	11.91	12.70	318.29	-0.76	2.11	3.96	7.09	328.2
14"OD	14.000	+0.063	-0.031	0.938	0.469	0.500	13./81	-0.030	0.109	2.06	7.14	14.10
	15.000	+1.00	0.021	0.029	0.460	0 500	14 701	0.020	0.100	0.165	0.212	15 10
15"OD	381.0	+1.60	-0.031	23.83	11 91	12 70	375 44	-0.050	2 77	4 19	7.97	383.5
	16 000	+0.062	0.021	0.028	0.469	0.500	15 791	-0.020	0.109	0.165	0 312	16 10
16"OD	406.4	+1.60	-0.79	23.83	11.91	12.70	400.84	-0.76	2.77	4.19	7.92	408.9
	18 000	+0.063	-0.031	1 000	0.469	0.500	17 781	-0.030	0.109	0.165	0.312	18 16
18"OD	457.2	+1.60	-0.79	25.40	11.91	12.70	451.64	-0.76	2.77	4.19	7.92	461.3
	20,000	+0.063	-0.031	1.000	0.469	0.500	19,781	-0.030	0.109	0.188	0.312	20.16
20"OD	508.0	+1.60	-0.79	25.40	11.91	12.70	502.44	-0.76	2.77	4.78	7.92	512.1
22100	22.000	+0.063	-0.031	1.000	0.500	0.563	21.656	-0.030	0.172	0.188	0.375	22.20
22-0D	559.0	+1.60	-0.79	25.40	12.70	14.30	550.06	-0.76	4.37	4.78	9.53	563.9
24"00	24.000	+0.063	-0.031	1.000	0.500	0.563	23.656	-0.030	0.172	0.218	0.375	24.20
24 00	609.6	+1.60	-0.79	25.40	12.70	14.30	600.86	-0.76	4.37	5.54	9.53	614.7

	W	1
		5/8"
()	X	
(	X	
		Hole Did

Run Size Inches	Branch Size Inches	Hole Diameter Inches + 1/8 -0	W Dimension Inches							
All	1/2, 3/4, 1	1 1/2	3 1/2							
2	1 1/4, 1 1/2	1 3/4 *	4							
All	1 1/4, 1 1/2	2	4							
All	2	2 1/2	4 1/2							
All	2 1/2	2 3/4	4 3/4							
All	3	3 1/2	5 1/2							
All	4	4 1/2	6 1/2							
* 2	* 2 X 1 1/4, 2 X 1 1/2 - Hole size 1-3/4 ±1/16 O.D									

### **COLUMN 1**

Nominal IPS pipe outside diameter.

### COLUMN 2

Maximum Deviation from square cut ends for 1.25" thru' 3" is 0.03"; for 4" thru' 6" is 0.045" and for 8" and above is 0.06".

### COLUMN 3

To provide a leak tight seal, the gasket seating area on pipe shall be free from roll marks, indentations, paint scale, dirt, chips, grease and rust etc.

### COLUMN 4

Groove width - Groove bottom to be free from loose dirt, chips, rust and scales. Bottom of grooves to be radius and the vertical wall of grooves must provide at least 0.03" vertical side for proper assembly of coupling.

### **COLUMN 5**

Groove outside diameter - The groove must be concentric to the pipe circumference. Groove must be within the diameter tolerance indicated.

#### **COLUMN 6**

Groove Depth - for reference only. Refer to Column 5

#### COLUMN 7

Minimum allowable wall thickness to which the pipe may be roll grooved or cut grooved.

### COLUMN 8

Maximum allowable pipe end flare diameter. Measured at the most extreme pipe ends.



# LARGE DIAMETER PIPE GROOVING SPECIFICATION





ROLL GROOVE

1 Nominal Size	2 Pipe Outside Diameter O.D. in/mm			3 Gasket Seat A	4 Groove Width B in/mm ±0.03/±0,76		5 Groove Diameter C in/mm		6 Groove Depth (Ref.)	7 Min. Allow. Wall Thickness in/mm		8 Max. Allow. Flare
0.00	Actual Size	Tolera	ance	in/mm +0.03/-0.06 +0,8/-1,5	Roll Groove	Cut Groove	Actual Size	Tol. +0.000 +0,00	D in/mm	Roll Groove T <sub>R</sub>	Cut Groove T <sub>c</sub>	Dia. in/mm
26 O.D.	26.00	+0093	-0.031	1.75	0.625	0.625	25.50	-0.063	0.250	0.250	0.625	26.20
	660.4	+2.36	- <mark>0.79</mark>	44.45	15.88	15.88	647.7	-1.60	6.35	6.35	15.88	665.5
28 O.D.	28.00	+0.093	-0.031	1.75	0.625	0.625	27.50	-0.063	0.250	0.250	0.625	28.20
	711.0	+2.36	- <mark>0.79</mark>	44.45	15.88	15.88	698.50	-1.60	6.35	6.35	15.88	716.3
30 O.D.	30.00	+0.093	-0.031	1.75	0.625	0.625	29.50	-0.063	0.250	0.250	0.625	30.20
	762.0	+2.36	-0.79	44.45	15.88	15.88	749.30	-1.60	<mark>6.35</mark>	6.35	15.88	767.1
32 O.D.	32.00	+0.093	-0.031	1.75	0.625	0.625	31.50	-0.063	0.250	0.250	0.625	32.20
	813.0	+2.36	-0.79	44.45	15.88	15.88	800.10	-1.60	6.35	6.35	15.88	817.9
36 O.D.	36.00	+0.093	-0.031	1.75	0.625	0.625	35.50	-0.063	0.250	0.250	0.625	36.20
	914.0	+2.36	-0.79	44.45	15.88	15.88	901.70	-1.60	6.35	6.35	15.88	919.5
42 O.D.	42.00	+0.093	-0.031	2.00	0.625	0.625	41.50	-0.063	0.250	0.250	0.625	42.20
	1067.0	+2.36	-0.79	50.80	15.88	15.88	1054.10	-1.60	6.35	6.35	15.88	1071.8

### **RECOMMENDED BOLT TORQUE RANGE**

Always use factory supplied bolts and nuts for assembly of National couplings. Never exceed the Recommended torque range by more than 25% as excessive torque can lead to joint failure, personal injury and or property damage. Always depressurize and drain the piping system before attempting disassembly, adjustment or removal of any piping component.

BOLT SIZE	TORQUE RANGE						
In	N-m	Los-Ft					
3/8	20-30	15-22					
1/2	40-68	30-50					
5/8	81-122	60-90					
3/4	129-237	96-175					





# INSTALLATION INSTRUCTIONS

#### MECHANICAL GROOVED COUPLINGS STYLES 5, 10, 11, 12

- 1. Remove one nut and bolt from housings. Loosen the other nut until it is flush with the end of the bolt. Remove the gasket from the housings.
- 2. Check suitability of gasket for intended service and apply a thin coat of silicone or other compatible pipe lubricant to gasket lips and outside of the gasket, if the gasket surface does not have lubricity.
- 3. Insert and push the gasket over one of the grooved ends of the two pipes to be joined. Gasket lip should not overhang pipe end.
- 4. Align and bring the pipe ends together and slide gasket into position centered between the grooves on each pipe. Gasket should not extend into groove on either pipe.
- 5. Place housings over gasket and apply pressure by hands to engage the keys into the grooves. Insert bolts and apply nuts finger tight. Make sure on Style 5 the tongue and groove match to avoid product failure.
- 6. Tighten nuts alternately and equally until housing bolts pads are firmly together, metal-to-metal. Uneven tightening will pinch the gasket. On Style 5 there may be a slight gap at bolt pads.
- 7. WARNING : DO NOT MAKE ADJUSTMENT TO GROOVED PRODUCTS WHILE THE PIPING SYSTEM IS UNDER PRESSURE.

#### REDUCING COUPLING STYLE 25

- 1. Remove nuts and bolts from housings. Remove gasket from housings.
- Check suitability of gasket for intended service and apply a thin coat of silicone or other suitable pipe lubricant to gasket lips and outside of gasket, if the gasket surface does not have lubricity.
- 3. Insert the large opening of the gasket over the larger pipe ends until the steel washer touches the pipe ends.
- Align the pipe centerline and insert the smaller pipe end into the gasket. A slight twisting motion of the pipe eases assembly. Steel washer will prevent the movement of smaller pipe inside the larger pipe.
- 5. Position the housing halves over the gasket, making sure the housing keys engage the grooves on each pipe. Proper lubrication of the interior of the housing and exterior of the gasket is important to prevent gasket pinching.
- 6. Insert the bolts and start the nuts manually. Tighten the nuts uniformly, alternating side until housing bolts pads meet firmly metal-to-metal. Uneven tightening will pinch the gasket.
- 7. WARNING : DO NOT MAKE ADJUSTMENT TO GROOVED PRODUCTS WHILE THE PIPING SYSTEM IS UNDER PRESSURE.

#### MECHANICAL BRANCH OUTLETS STYLES 13,15,16

- 1. Cut or drill hole in pipe. Hole diameter for each mechanical branch out-let is listed on the chart pertaining to the product. Holes must be drilled on the center-line of the pipe. Remove the cut piece and cutting chips. Make sure that the pipe surface within 7/8" of the hole is clean, smooth and free of indentations or projections which would affect proper sealing.
- 2. Remove one nut and bolt from assembled housings. Loosen the other nut until it is flush with the end of bolt. Remove the tape and lift the gasket.
- 3. Check suitability of gasket for intended service. Reposition the gasket into the housing using alignment tabs on the sides for proper positioning.
- 4. Rotate the lower housing approximately 90 degrees away from the upper or outlet section. Place the upper on to the surface of the pipe in line with the outlet hole prepared per instructions and rotate the lower section around the pipe and close the two halves.
- 5. Insert bolt in its hole and finger tighten both nuts, making sure that the locating collar is in the outlet hole. Also make sure that the positioning lugs are aligned properly.
- 6. Tighten nuts uniformly until the gasket pocket area of the upper housing is in complete contact with pipe surface and the assembly is rigid. Nuts must be tightened with even gaps between bolt pads. Torque in excess of what is recommended is not desirable.
- 7. WARNING : DO NOT MAKE ADJUSTMENT TO GROOVED PRODUCTS WHILE THE PIPING SYSTEM IS UNDER PRESSURE.

#### GROOVE FLANGE ADAPTER STYLE 14

- 1. Open the Flange Adapter and place hinged flange around the grooved pipe end with the circular key section locating into the groove.
- 2. Insert a standard bolt through the mating holes of the Flange to secure the Flange in the groove.
- 3. Check suitability of gasket for the intended service and apply a thin coat of silicone or other compatible lubricant to gasket lips and outside of the gasket, if the gasket surface does not have lubricity.
- 4. Press the gasket into cavity between the pipe OD. and Flange recess.
- 5. Insert a standard Flange bolt in the hinge hole opposite the lockbolt and direct the two bolt assembly to mate with the Flange of the device to be joined.
- 6. Add the remaining standard Flange bolts and tighten all nuts evenly until faces contact firmly or bolts attain recommended joint torque values.
- 7. WARNING: DO NOT MAKE ADJUSTMENT TO GROOVED PRODUCTS WHILE THE PIPING SYSTEM IS UNDER PRESSURE.

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#### **Pipe Preparation** :

Check the outside diameter.

Do ensure that the pipe has the outside diameter and thickness for the intended service .

National fittings are identified by the nominal size, but always check the actual OD of the pipe and fittings are compatible, to avoid mismatch as indicated. The nominal size 21/2'' (65) is referred to pipes with 73 mm (2.875'')pipe OD in IPS (American), whereas 76.1 mm (3.0'')pipe OD in IS, AS, BS, DIN(ISO).

IPS : American standards ASTM A 53 / A795 / A120/ A106 series. etc

IS : Indian standards IS1239 / IS 3589 etc BS: British standard BS 1387 / BS 3601 etc DIN : 2440 / 2441 etc

Sizes -	-Inches	Size – M	illimeters	Sizes	–Inches	Size –N	lillimeters
Nominal size	Actual OD	Nominal Size	Actual OD	Nominal size	Actual OD	Nominal Size	Actual OD
1	1.315	25	33.4	8	8.625	200	219.1
11/4	1.660	32	42.2	10	10.750	250	273.0
11/2	1.900	40	48.3	12	12.750	300	323.9
2	2.375	50	60.3	14	14.000	350	355.6
21/2	2.875	65	73.0	16	16.000	400	406.4
3 OD	3.000	65	76.1	18	18.000	450	457.2
3	3.500	80	88.9	20	20.000	500	508.0
4	4.500	100	114.3	22	22.000	550	559.0
5	5.563	125	141.3	24	24.000	600	609.6
51/2 OD	5.500	125	139.7	28	28.000	700	711.0
61/2od	6.500	150	165.1	30	30.000	750	762.0
6	6.625	150	168.3	36	36.000	900	914.0

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**Roll grooving:** Roll grooving was developed for thin wall pipe , which had insufficient thickness for cut grooving. Roll grooving is practical now on standard and pipes upto 9.5 mm wall , depending on machine and designed rollers .



In Roll grooving , no material is removed from pipe itself, it radially displaces the pipe material to form required shape. The inside protrusion is small and smooth and thus negligible effect on both flow or line pressure .Roll grooving is practical for pipe having hardness of HB 180 or less.

The pipe is loaded on bottom roller and the hydraulically operated top roller compresses the pipe to attain the required dimensions. The pipe is kept free to rotate along the rollers to attain gradual & on radial circumference.

Roll grooving can be processed on carbon steel, stainless steel, copper and aluminium pipes. Different materials and pipe diameter may require suitable sets of roll sets. Do consult your grooving machine manual or Interfit for more information.





Cut grooving : In cut grooving process , the material from pipe wall is removed to form a groove . It is intended for use with standard and higher wall pipes. Cut grooving produces a square cut groove , with out any protrusion on the inside dia and is used on areas where expansion – contraction features are fully required and also where the pipe has lined / coated pipes. If the fluid in transmission is abrasive in nature , cut groove is useful.





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Basic groove dimensions. (Refer Page 26 of catalogue publication GPC -08)





Column 1: Nominal IPS pipe outside diameter.

Column 2 : Acceptable tolerance of the pipe outside diameter is indicated . Pipe ends are required to square and maximum deviation from square cut ends for 1.25 through 3" is 0.03"; for 4" through 6" is 0.045" and for 8" and avove is 0.06"(1.5mm)

#### Column 3:

To provide a leak tight seal, the gasket seating area on pipe shall be free from roll marks, indentations, paint scale, dirt, chips, grease, rust etc.

#### Column 4:

Groove width- groove bottom to be free from loose dirt, chips, rust and scales. Bottom of grooves to be radius and the vertical wall of grooves must provide at least 0.03" vertical side for proper assembly of coupling.

#### Column 5

Groove outside diameter – The groove must be concentric to the pipe circumference . Groove must be within the indicated diameter tolerance.

Column 6

Groove depth - for reference 5

Column 7

Maximum allowable wall thickness to which the pipe may be roll grooved or cut grooved.

Column 8

Maximum allowable pipe end flare diameter, measured at the most extreme pipe ends.





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#### Installation : Couplings

a) Check pipe end to be square and to be clean.



b) Check suitability of gasket for the intended service .



- c) Pre-lube gaskets does not require / very little –lubrication. Apply thin layer of silicone based
  (gasket friendly) lubricant ,both outside and inside the gasket. This will help inserting smoothly and without pinching .
- d) Install the gasket over one end of the pipe ,so that pipe end is fully exposed.
- e) Bring together and align the two pipe ends to be joined. Slide the gasket over the ends and center it between the grooves of the pipe to be joined .





- f) Insert the first bolt and apply the nut to hand tight. Insert the second bolt and nut making sure that the oval neck of both bolts engage the holes in the coupling housing.
- g) Alternately and equally tighten until bolt pads meet and make a metal to metal contact.

#### Caution Note :

 a) The style 5, RIGID coupling features a tongue – groove combination in our design. The couplings must always be installed so that tongue and groove mate properly. Attempting to install these couplings tongue to tongue or groove to groove will result in failure of the joint, property damage or serious injury.

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- b) Uneven tightening of bolts may cause the gasket to be pinched, resulting in an immediate or delayed leak.
- c) Excessive tightening torque on nuts may cause a bolt or joint failure.

#### Hole cut, Branch-let mechanical tees.

The hole-cut method of pipe preparation is required when installing the models 13, 15, 16 and cross combinations.(page 11- 13, 26)



This method of pipe preparation requires the cutting or drilling of a specified hole size on the centerline of the pipe. Please refer catalogue for hole-saw sizes .Use always the correct hole saw size as shown and NEVER a torch or arc for cutting hole.

After the hole has been cut, all rough edges must be removed and the area with in 5/8" of the hole. This surface must be clean, smooth and free from indentation or projection, which will affect proper sealing.

The pipe around the entire circumference within "W" dimension must be free from any dirt and scale, which might affect sealing performance.



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#### Installation steps:

Determine the location for the hole. Use correct size hole saw as specified for cutting the hole.

Remove burrs and clean the pipe surface around the hole .





Remove the gasket into the cavity of the housing. The alignment tabs on the side of the gasket should be properly sit into the recess.

Assemble one end the lower housing loosely, leaving one nut and bolt off to allow for a "swing-over" installation.







Place the branch housing on the pipe hole, so that the locating collar engages properly into the hole. Then bring the lower housing to clamp the pipe.

Insert the remaining bolt and apply the nut hand tight. Make sure that the oval neck of the bolt engages into the bolt hole of the housing.

Re-check to ensure the locating collar is properly seated in the hole and tighten the nuts alternately and equally until the outlet housing comes to contact the outer surface of the pipe. Use a torque wrench for exact tightening and if in doubt.



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#### Flange style 14 :

Style 14 flanges are available drilled to PN10/16 (14P) and also ANSI 125/150 (14A).

Check your requirement and make sure the compatibility.

Installing the flange .

a) Fully open the hinged flange segments and then place the segments around the groove of the pipe end. Pull together the ends , until the mating bolt holes of the flange ends meets.



- b) Using wrench or similar tool, draw the closure tabs together until the mating holes are aligned.
- c) Insert the OEM bolt through the mating hole , making sure that the flange is fully engaged in the pipe grooves.





- d) Recheck the gasket and make sure the correctness . Apply thin layer of lubricant to the sealing lip of the gasket.
- e) Place the gasket into the gasket cavity between pipe OD and flange cavity and tighten the nut .
- f) Mate adjoining counter flange and add the bolts initially with hand tightening and then as per diametrically opposite standard industry practice.





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# **GROOVING PROCESS**

# Work Area & Machine Set-up

1. Make sure the work area as under;

- Adequate lighting
- > No flammable liquids (or) vapors that might ignite.
- Grounded electrical outlet
- Clear path to the electrical outlet without any oil, sharp edges or moving parts which may damage the electric cord.
- > Dry place for machine and operator.
- > Clean up the work area prior to setup the grooving machine.
- 2. Use **two people** to lift the roll groover and third person inserts four support legs in to the base sockets. **Refer to Figure A.**



- 3. Turn the upper portion of the leg until the foot makes full contact with ground. Adjust all four legs until the machine is level. Secure set screws to fix legs.
- 4. Install pump handle with pin attached.
- 5. Make sure the power switch us in the OFF position.
- 6. Place the foot switch so that the operator can safely control the roll groover and workpiece. It should allow the operator to do the following:
  - Stand facing the hydraulic pump.
  - > Control the foot switch with left foot.



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Have convenient access to the groover and hydraulic pump without reaching across the machine.

- 7. Plug the machine into the power socket and make sure cord is in good & safe condition.
- 8. Inspect the roll groover as following steps:
  - > Turn the power switch in ON position.
  - Press and release the foot switch. Check that the groove roll rotates in a counterclockwise direction as the operator faces the groover.
  - Depress the foot switch and hold. Inspect all moving parts for misalignment, binding, odd noise or any other unusual conditions.
  - > Release foot switch and turn the power switch in OFF position.

# **Pipe Preparation**

These are general instruction only. Always follow grooved coupling manufacturer's specific recommendations for pipe end preparation. Failure to follow the grooved coupling manufacturer's recommendations may lead to an improper connection and cause leaks.

- 1. Cut pipe to proper length. Make sure pipe end is cut square and free of burrs. Cut off method and large burrs can affect the quality of the groove made and the tracking of the groove. Do not attempt to groove pipe that has been cut with a torch.
- 2. All internal/external weld bead, flash, or seams must be ground flush at least 2" back from the end of the pipe. Do not cut flats into gasket seat area, this could cause leaks.
- 3. Remove all scale, dirt, rust and other contaminants at least 2"/50mm back from the end of the pipe. Contaminants can clog the drive knurls and prevent proper driving and tracking of the pipe while grooving.
- 4. Make sure that the pipes to be grooved have appropriate support. When using one pipe stand, make sure the stand supports the pipe at the place where 3/4 of the total length from the grooved end. Refer to Figure A.
- 5. Pipes equal or **over** 6.0metre should be supported with **at least two pipe stands**. Locate each stand at the 1/3 point of the pipe. Failure to properly support the pipe may allow the pipe or the pipe and machine to tip and fall.
- 6. Square pipe and pipe support to roll groover making sure pipe is flush against drive roll plate.
- 7. Verify that the pipe is level or sloped slightly downward away from the operator (pipe stand slightly lower than the groove machine about 1°-2°).
- 8. Turn the power switch to ON position, depress the foot switch and hold. Observe the pipe rotation. If the pipe turns spiral and tends to "walk off" the drive roll, check setup and level status of the pipe. If correct, slightly offset the pipe and pipe stands approximately 1°-2° degree (about 2" over at 10 feet/ 50mm over at 3.0meters from the roll groover) away from the operator. Recheck the rotation until pipe turns stable.







# **Test Grooving**

### A test grooving should be always performed when setting up or changing pipe sizes.

- 1. Turn the pump knob clockwise, in "ON" direction, till full close. Press down the pump lever to push down the groove roll in contact with the pipe top surface.
- 2. Turn down the stop knob clockwise until it contacts the oil cylinder top surface. The pipe and roll groover should be secure to each other at this stage. Refer to Figure 3.
- 3. Depend on required groove depth (refer to Chart B "Groove Dimensions"), turn up the stop knob counterclockwise. Each full circle is approximately 1/16" (2mm).
- 4. Turn the gear of the pipe stabilizer clockwise until the stabilizer stay in touch with pipe body.



- 5. Start the roll groover by step on the foot switch while pressing down the pump lever. Allow one full pipe rotation between nan strokes of the pump lever.
- 6. When the stop knob contacts the cylinder top surface, allow two more full pipe rotation.
- 7. Stop the roll groover by releasing food switch. Loose the pump knob counter-clockwise and perform groove inspection. Use groove tape to check groove diameter.
- 8. If the groove is too large, the groover can be adjusted and the groove will be made smaller by turning stop knob counter-clockwise slightly. Repeat steps 4 -6. If the groove is too small, turn the stop knob clockwise slightly. Another groove will need to be made. Proper groove diameter is important to insure connection performance. Out of specification grooves could cause joint failure.

## Regular Grooving:-

- 1. After the test grooving is made and the groove meets requirement, make sure the stop knob is in touch with oil cylinder surface. The roll groover is ready to operate on pipes in the same size.
- 2. Implement at least one groove diameter inspection after every 5 grooves are formed.







# MAINTENANCE INSTRUCTIONS

# Lubrication

- Grease nozzle of Drive Shaft lubrication located on the side of the groover housing. Roll shaft nozzle at the front-center of the roll shaft. Always add grease until a small amount is pushed out.
- At least every 4 hours of operation, lubricate the roll shaft.
- Every month, add grease to the drive shaft lubrication nozzle.
- The gear box of the Roll Groover is greased for life and does not require the addition of any grease unless the gear box is opened. See Inspection Section for other information on maintenance
- Grease the bearing prior to assembling when repairing the roll groover.

## Clean

- Clean the driveshaft knurls with a wire brush on a daily basis or more often if needed.
- Clean the unit surface with dry soft cotton cloth.

# **Machine Storage**

- Store the tool in a locked area that is out of reach of children and people unfamiliar with roll groover equipment. This tool can cause serious injury in the hands of untrained users.
- Store the tool in a locked area away from moisture and corrosion material. Apply a thin coat of anti-rush liquid on moving parts and shafts are strongly recommended.



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# Troubleshooting

Problem	Cause	Correction
Pump not delivering oil, cylinder does not	Low hydraulic oil in reservoir	Check oil level and add hydraulic oil if necessary.
advance	Low quality oil, pump nuzzle blocked.	Change qualified oil and flush the oil tube.
	Seat inside the check valve worn or leak.	Loose screws and spring, knock the steel shot with proper tool and recreate sealing.
Unusual loud and sharp noise from the pipe when grooving.	Wrong position of pipe stand with long pipe causes echo	Relocate the pipe stand to right or left.
	Pipe end not square cut with pipe axis. Pipe end scratch the drive shaft plate.	Cut pipe end square.
	Excessive friction between pipe and drive roll.	Apply a thin coat of grease on pipe end.
Pipe will not trach while grooving	Pipe not level.	Adjust stand to level pipe.
	Stabilizer wheel not engaging pipe.	Offset pipe 1°-2° and tight the stabilizer again.
	Groover not level.	Level groover.
Pipe rocks from side to side	Improper setup of pipe stand.	Adjust the pipe stand location, direction and height.
	Pipe end flattened or damaged	Cut off damaged pipe end or grind flat.

# Service and Repair

The "Maintenance Instructions" will take care of most of the service needs of this machine. Any problems not addressed by this section should only be handled by an authorized service technician. When servicing this machine, only identical replacement parts should be used. Use of other parts may lead to functional issues.







## PIPE PREPARATION FOR MECHANICAL BRANCHLETS

Cut or drill the hole in pipe. Hole diameter for each size is listed in Table. Holes must be drilled on centerline of pipe. Remove the cut piece and cutting chips. Check pipe surface within 5/8" of the hole. This surface must be clean, smooth and free from indentation or projection, which would affect proper sealing. The pipe around entire circumference within the 'W' dimension must be free from any dirt and scale, which might affect sealing performance on the pipe surface (See Table).

# PIPE GROOVING SPECIFICATIONS



1	2		3 4 Granua Width		5		6 7		8			
188 V. W.	Pipe O	OD OD	imeter	Gasket Seat	Groov	B	Groove	Diameter C	Groove Depth	Min. Allowable Wall Thickness		Max.
Nominal	J	in/mm	_	A	+ 0.03	()/:0.79 / mm	in	/mm	(Ref.)	in	/mm	Flare
1000	Actual	Toler	ance	in/mm	Roll	Cut	Actual	Toler.	D	Roll	Cut	Dia,
	Size	10000000		+ 0.79	Groove	Groove	Size	+.0.00	in/mm	Ta	Te	in/mm
1*	1,315	+0.013	-0.013	0.625	0.281	0.313 7.95	1.190 30.23	-0.015	0.063	0.065	0.133	1.43
1 1/4"	1.660	+0.016	-0.016	0.625	0.281	0.313	1.535 38.99	-0.015	0.063	0.065	0.140	1.77
1 1/2"	1.900	+0.019	-0.019	0.625	0.281	0.313	1,775	-0.015	0.063	0.065	0.145	2,01
2"	2.375	+0.024	-0.024	0.625	0.344	0.313	2.250	-0.015	0.063	0.065	0.154	2.48
2 1/2"	2.875	+0.029	-0.029	0.625	0.344	0.313	2.720	-0.018	0.078	0.083	0.188	2.98
3" OD	3.000	+0.030	-0.030	0.625	0.344	0.313	2.845	-0.018	0.078	0.083	0.188	3.10
3"	3.500	+0.035	-0.031	0.625	0.344	0.313	3.344	-0.018	0.078	0.083	0.188	3.60
4ª	4.500	+0.045	-0.031	0.625	0.344	0.375	4.334	-0.020	0.083	0.083	0.203	4.60
5*	5.563	+0.056	-0.031	0.625	0.344	0.375	5.395	-0.022	0.084	0.109	0.203	5.66
5 1/2" OD	5.500	+0.056	-0.031	0.625	0.344	0.375	5.334	-0.020	0.083	0.109	0.203	5.60
6*0D	6.000 152.4	+0.056	-0.031 -0.79	0.625	0.344	0.375	5.830 148.08	+0.022	0.085	0.109	0.219	6.10 154.9
6°	6.625	+0.063	-0.031	0.625	0.344	0.375	6.455	-0.022	0.085	0.109	0.219	6.73
6 1/2° OD	6.500	+0.063	-0.031	0.625	0.344	0.375	6.330	-0.022	0.085	0.109	0.219	6,60
8"	8.625	+0.063	-0.031	0.750	0.469	0.438	8.441	-0.025	0.092	0.109	0.238	8.80
10"	10.750 273.0	+0.063	-0.031	0.750	0.469	0.500	10.562	-0.027	0.094	0.134	0.250	10.92
12"	12.750	+0.063	-0.031	0.750	0.469	0.500	12.531	-0.030	0.109	0.156	0.279	12.92
14'0D	14.000	+0.063	-0.031	0.938	0.469	0.500	13.781	-0.030	0.109	0.156	0.281	14.10
15"OD	15.000 381.0	+0.063	-0.031	0.938	0.469	0.500	14.781 375.44	-0.030	0.109	0.165	0.312	15.10 383.5
16'0D	16.000	+0.063	-0.031	0.938	0.469	0.500	15.781	-0.030	0.109	0,165	0.312	16.10
18"OD	18.000	+0.063	-0.031	1.000	0.469	0.500	17.781	-0.030	0.109	0.165	0.312	18.16
20"OD	20.000	+0.063	-0.031	1.000	0.469	0.500	19.781 502.44	-0.030	0.109	0.188	0.312	20.16
22"OD	22.000	+0.063	-0.031	1.000	0.500	0.563	21.656	-0.030	0.172	0.188	0.375	22.20
24"OD	24,000	+0.063	-0.031	1.000	0.500	0.563	23.656	-0.030	0.172	0.218	0.375	24.20



### COLUMN 1

Nominal IPS pipe outside diameter.

### COLUMN 2

Maximum Deviation from square cut ends for 1.25" thru' 3" is 0.03"; for 4" thru' 6" is 0.045" and for 8" and above is 0.06".

### COLUMN 3

To provide a leak tight seal, the gasket seating area on pipe shall be free from roll marks, indentations, paint scale, dirt, chips, grease and rust etc.

### COLUMN 4

Groove width - Groove bottom to be free from loose dirt, chips, rust and scales. Bottom of grooves to be radius and the vertical wall of grooves must provide at least 0.03" vertical side for proper assembly of coupling.

### COLUMN 5

Groove outside diameter - The groove must be concentric to the pipe circumference. Groove must be within the diameter tolerance indicated.

#### COLUMN 6

Groove Depth - for reference only. Refer to Column 5

#### COLUMN 7

Minimum allowable wall thickness to which the pipe may be roll grooved or cut grooved.

### COLUMN 8

Maximum allowable pipe end flare diameter. Measured at the most extreme pipe ends.







### **UL FM Certified Grooved Fittings**

National grooved fittings are commonly used in piping systems for their ease of installation and reliability. Proper storage and handling are crucial to maintaining the quality and integrity of these fittings and ensuring they perform as intended. Here are general instructions for the storage and handling of our mechanical grooved fittings:

# **STORAGE:**

### 1. Dry Storage:

Store fittings in a dry, covered area to prevent exposure to moisture. Moisture can lead to corrosion and compromise the paint or galvanized coating.

### 2. Avoid Direct Sunlight:

Keep fittings away from direct sunlight to prevent UV damage and overheating.

### 3. Ventilation:

Ensure proper ventilation to prevent the buildup of condensation, which can contribute to corrosion.

### 4. Stacking:

Do not stack fittings too high to prevent deformation or damage. If stacking is necessary, use appropriate supports to evenly distribute the load.

### 5. Temperature Control:

Store fittings in an environment with a controlled temperature to prevent extreme temperature fluctuations, which can affect the material properties.

## HANDLING:

### 1. Use Proper Equipment:

When moving or transporting fittings, use appropriate lifting equipment such as cranes or forklifts. Avoid dropping or dragging fittings, as this can cause damage.

### 2. Inspect Upon Receipt:

Inspect fittings upon receipt for any visible damage. If damage is observed, report it to quality teams and follow their guidelines for replacement.

### 3. Avoid Impact:

Handle fittings with care to avoid impact or collisions that could result in dents, scratches, or other damage.

### 4. Avoid Contamination:

Keep fittings away from dirt, dust, soil and other contaminants. If contamination occurs, clean the fittings before installation.

### 5. Follow Manufacturer's Guidelines:

Adhere to the manufacturer's specific guidelines for handling and installation. Different types of grooved fittings may have unique requirements.

### 6. Protect Threads and Gaskets:

Take care to protect threads and gaskets from damage. Threaded portions should be covered during storage and handling to prevent nicks or dents.

### 7. Store Away from Chemicals:

If possible, store fittings away from chemicals that may cause corrosion or degradation of the material.

### 8. Labeling:

Keep fittings labeled and organized to facilitate easy identification and retrieval.

### 9. Training:

Ensure that personnel involved in the handling of grooved fittings are adequately trained on proper procedures and guidelines.

......The End.....