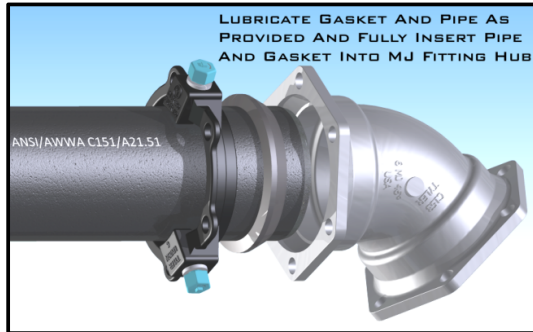


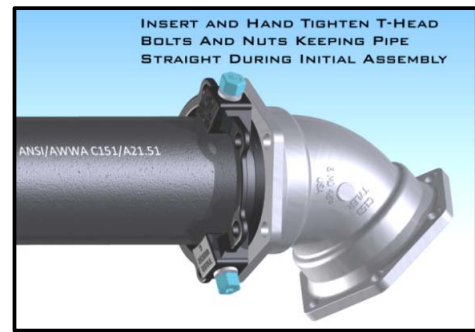


Assembly Steps – Series 1000 – For Ductile Iron Pipe

Steps : 1 and 2

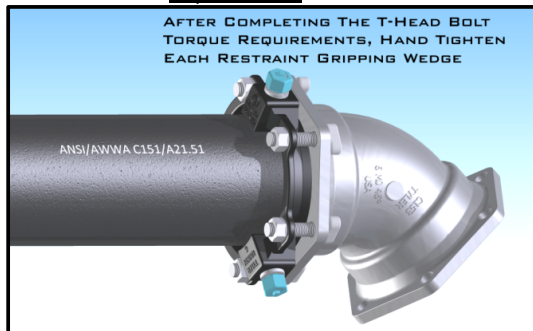


Step : 3

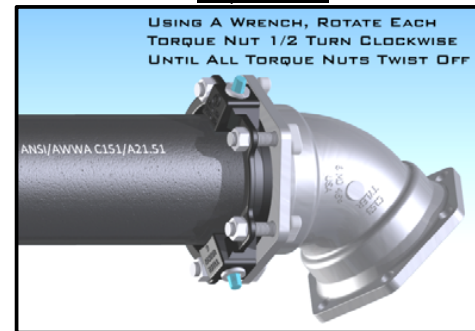


1. Insure the beveled pipe end to be joined and mechanical joint socket are clean and free of debris. Slide the Black TUF Grip onto the pipe to be restrained. The TUF Grip compression lip extension must be toward the beveled end of the pipe to be restrained.
2. Evenly lubricate the beveled pipe end, pipe wall exterior, and inside surface of the MJ gasket with a lubricant that meets the requirements of AWWA C111. Now place the **MJ gasket over the plain beveled end of the pipe with the narrow edge of the tapered gasket toward the beveled end of the pipe to be restrained. ****NOTE :** For Steel pipe with IPS diameter in sizes 3”-12”, use of a MJ Transition gasket is required.
3. Fully insert the pipe end into the MJ socket pipe landing. Keeping the pipe straight, slide/push the MJ gasket firmly and evenly into the socket recess. Joint must be kept straight during assembly.

Steps : 4 and 5



Steps : 6 and 7



4. Push the TUF Grip compression lip extension evenly against the thick side of the gasket and insert T-Head bolts with the T-Head against the back side of the MJ fitting bolt flange. Use only T-Head bolts and nuts that meet AWWA C111 requirements. Evenly hand-tighten the nuts on the T-Head bolts making sure the gland is centered around the pipe and within the MJ socket. If joint deflection is needed, only deflect the pipe in the joint after hand tightening of all nuts is completed. *Joint deflection is 3° max for 3”, 5° max for 4”-12”, 2° max for 14”-16”, and 1.5° max for 18”- 48”.
***NOTE :** Maximum deflection values provided apply with nominal pipe, fitting, and restraint diameters.
5. Using a wrench, tighten the nuts on the T-Head bolts a few turns at a time in an alternating or star pattern maintaining equal spacing or distance between the TUF Grip bolt flange and face of the MJ socket bolt flange as the MJ gasket is compressed. The T-Head bolt and nut torque requirement is 45-60 ft-lb for 3”, 75-90 ft-lb for 4”- 24”, 100-120 ft-lb for 30”- 36”, and 120-150 ft-lb for 42”- 48”. **DO NOT OVER-TORQUE!**
6. Hand-tighten the torque limiting nut attached to each TUF Grip wedge assembly in a clockwise direction with an alternating or star pattern until all gripping wedges are in contact with the pipe wall. Rotational direction of torque limiting nut is indicated by a recessed arrow on the face of the nut. With a wrench (box, socket, or pneumatic), continue to tighten each torque nut ½ turn in an alternating or star pattern around the restraint until all torque limiting nuts twist off. **NEVER** turn a torque limiting nut more than ½ turn without turning the remaining torque nuts an equal amount!
7. When all torque limiting nuts twist off, the assembly of the mechanical joint is complete.

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TUFGRIP[™]

Series 1000 - For Ductile Iron Pipe

"A Proven Third Generation Mechanical Joint Restraint"



MJ TUF Grip[™] TLD

Torque Nut



TYLER UNION
Quality Waterworks Products

Tyler Union's TUF Grip restraints represent the culmination of 20 years of engineering and testing. As a 3rd generation restraint, TUF Grip is the best available technology in the Waterworks market for use in restraining Ductile Iron Pipe.



Designed by Harold Kennedy & Associates, Inc.

"BETTER BY DESIGN"

SPECIFICATIONS:

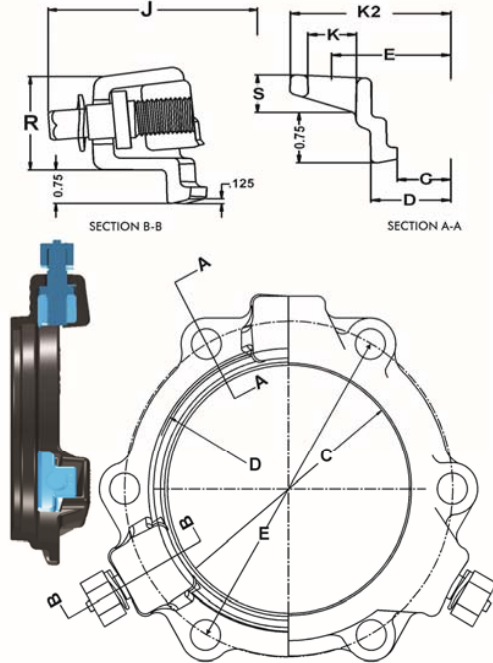
- Designed and proven to restrain plain end ductile iron pipe conforming to ANSI/AWWA C151/A21.51 in diameters 3" - 48"
- Proven for use on heavy wall **Schedule 40 or greater steel pipe in sizes 3"- 12" and on all sizes 3" - 16" when pipe O.D. and wall thickness conforms to C151 **Note: IPS diameter steel pipe requires the use of an MJ Transition gasket
- Restraint design conforms with applicable requirements of ANSI/AWWA C111, ANSI/AWWA C153, and ANSI/AWWA C110
- Restraint engineered for securing plain end pipe to mechanical joint fittings conforming to ANSI/AWWA C110, C111, and C153
- Restraints rated for working water pressure of 350 psi and transitory surges of 100psi for 3" - 16" and 250 psi for 18" - 48"
- Cast of ASTM A536 compliant 65-45-12 ductile iron complete with a cast on date code and country of origin for traceability
- Restraints and all components are designed and proven for a 2:1 safety factor based on the pipe pressure rating
- Restraint deflection rating when installed on nominal diameter pipe: 3° max for 3", 5° max for 4"-12", 2° max for 14"-16", and 1.5° max for 18"- 48"
- Standard coating for **Non-Domestic** restraint is 4-6 mil of *Alkyd resin baking enamel - ***Note: Epoxy coatings available upon request**
- Gripping wedges are heat treated to a minimum 420 Brinell Hardness
- Gripping wedge, wedge collar bolt, and twist off torque limiting nut shall be e-coated
- FM approved for 4" - 12" applications and UL listed and approved for 3" - 36" applications
- Not recommended for use on plain end fittings
- Color coded black for pipe type(ductile/*cast iron/*steel) - ***Note: Refer to the following pages for cast iron and steel pipe applications**

FEATURES & ADVANTAGES:

- Torque limiting nut on gripping wedge assembly twists off within a designed torque range eliminating the need for specialized tools
- Gripping wedge assembly pivots providing stronger engagement of pipe wall at lower torque requirement (45-60 ft-lb)
- Proven restraint technology utilizing fewer gripping wedges in frequently applied diameters, reducing trench time and project cost
- Restraint's heavy duty construction and design eliminates the need for costly thrust blocks and tie rods
- Suitable for potable and wastewater applications

ISO 9001-2015 Registered	Listed with Underwriters Laboratory	Factory Mutual Approved		
Product Source/Type	Name of Project	Name of Contractor	Project Engineer	Spec. Section and/or Project No.

Series 1000-Ductile Pipe Restraint



TUF Grip[™] MJ Restraint Dimensions

Size (inches)	C	D	E	K2	J	K	R	S
3	4.08	4.88	6.19	7.67	9.82	3/4	2.20	0.86
4	4.93	5.92	7.50	8.98	10.67	7/8	2.20	0.73
6	7.03	8.02	9.50	10.98	12.77	7/8	2.24	0.82
8	9.18	10.17	11.75	13.23	14.92	7/8	2.28	0.82
10	11.23	12.22	14.00	15.70	16.97	7/8	2.37	0.93
12	13.33	14.32	16.25	17.95	19.07	7/8	2.40	0.93
14	15.44	16.40	18.75	20.43	21.18	7/8	2.57	0.91
16	17.54	18.50	21.00	22.88	23.28	7/8	2.57	1.05
18	19.64	20.60	23.25	25.43	25.38	7/8	2.57	1.05
20	21.74	22.70	25.50	27.50	27.48	7/8	2.66	1.15
24	25.94	26.90	30.00	32.00	31.68	7/8	2.72	1.35
30	32.18	33.30	36.88	39.42	39.78	1-1/8	3.86	1.53
36	38.48	39.60	43.75	46.29	46.08	1-1/8	3.86	1.53
42	44.68	45.80	50.62	53.62	53.08	1-3/8	4.56	2.05
48	50.98	52.10	57.50	60.50	59.28	1-3/8	4.56	2.05

SERIES 1000 TLD-DUCTILE TUF Grip[™] - APPLICATION CHART

Size (Inches)	Part # - Gland Only Non-Domestic	Wedge Qty.	T-Head Bolt Qty.	Bolt Size	Gland Weight (lbs.)	Weight (w/Acc.)	Pressure Rating	Pipe O.D.
3	113805	2	4	5/8" x 3"	6.5	10.5	350	3.96
4	113812	2	4	3/4" x 3 1/2"	7.1	11.8	350	4.80
6	113829	3	6	3/4" x 4"	11.2	18.8	350	6.90
8	113836	3	6	3/4" x 4"	13.1	20.3	350	9.05
10	113843	6	8	3/4" x 4"	26.0	32.5	350	11.10
12	113850	8	8	3/4" x 4"	31.5	40.4	350	13.20
14	113867	10	10	3/4" x 4 1/2"	43.3	53.6	350	15.30
16	113874	12	12	3/4" x 4 1/2"	54.1	66.3	350	17.40
18	113898	12	12	3/4" x 4 1/2"	59.8	72.2	250	19.50
20	113904	14	14	3/4" x 4 1/2"	69.8	83.8	250	21.60
24	113911	16	16	3/4" x 5"	90.4	106.9	250	25.80
30	461289	20	20	1" x 7 1/2"	248	290	250	32.00
36	461333	24	24	1" x 7 1/2"	277	327	250	38.30
42	461319	28	28	1-1/4" x 8 1/2"	448	512	250	44.50
48	461326	32	32	1-1/4" x 8 1/2"	519	597	250	50.80

ISO 9001-2015 Registered

Listed with Underwriters Laboratory

Factory Mutual Approved

STOP-LOOK :

- Extra length T-Head bolts are provided with 30" - 48" restraints to facilitate mechanical joint assembly
- For UL/FM Approvals, 3" - 12" were tested at 5° of deflection and 14" - 24" inch were tested at 3° of deflection; all test were to 700 psi
- The Series 1000 TUF Grip is specified for use on ductile iron pipe but can be used on some sizes of cast grey iron or pit cast pipe if the pipe is not severely corroded, is in sound condition, and has an outside diameter compatible with the as provided dimensions
- TUF Grip 30" - 48" inch provided with TRU-Lock[™] mechanical joint gasket to ensure pressure ratings and safety factors are met
- Installation and hydrostatic testing shall be in accordance with AWWA C600 and AWWA C651
- Some vertical applications where piping is partially buried may require additional restraint – Contact Tyler Union
- **Caution:** Pressure testing of piping systems restrained or un-restrained with insufficient backfill or bracing is not recommended