USA INDUSTRIES
Since 1982

GripSafe® ST

INSTALLATION MANUAL

Small Double Block & Bleed (DBB) Plug

¾” – 4”*

***For 4” Schedules 120, 160 and XXH only. Additional 4” Schedules Require the GripSafe ST Large DBB Plug**

Manufactured Exclusively by USA Industries, an ISO 9001:2015 Certified Company

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Table of Contents

1. Introduction

Thank you for choosing GripSafe ST pipe plugging technology. This manual covers the proper use of this technology to ensure safe operating conditions. All necessary sockets and wrenches to install this equipment are available for rental/purchase from USA Industries, LLC. See **Section 4 Table 2** for sockets.

The information in this manual is intended for the use of a GripSafe ST IIB plug in metallic piping. If the intended use of this plug is for any piping other than metallic piping please contact USA Industries Customer Service Department for technical support.

⚠ **Do not use GripSafe ST equipment before fully reading and comprehending and comprehending this manual**

⚠ **Failure to follow this manual in full may result in injury to personnel and damage to equipment.**

2. Safety

⚠ Failure to follow proper safety requirements may result in the GripSafe® Plug failing, which could lead to personnel injury, material loss, and damage to equipment.

⚠ Wear proper PPE when performing any task with the GripSafe® Plug as defined by site safety rules. Always follow site procedure for safely lifting and operating equipment.

⚠ Never install the GripSafe® Plug in a position where the Gripping Wedge would be located over weld droop or ridge.

⚠ Never install the Seals or Gripping Wedge over a section of pipe that is missing its interior wall; e.g. weldolet, tee, etc.

⚠ Use care in the handling of the Wedge Studs. Never beat, hammer, or pry on the Wedge Studs. Never remove the nut located on the Wedge Studs.

⚠ Pressure testing can be an extremely hazardous operation and safety precautions should be strictly adhered to. Never stand or pass in front of any test plug while installed or while testing is in progress.

⚠ Do not make any adjustments to the plug, safety equipment, or vessel while the plug is under pressure.

⚠ Do not exceed rated pressure stamped on the plug. Plugs are rated for holding pressure in one direction only, never apply pressure on the non-rated side of the plug.

⚠ Backpressure rating on the plug is in reference to the plugs ultimate holding capacity. Never exceed the pressure capacity of the weakest component in a pressurized system. It is imperative that a system's components be studied prior to beginning a pressure test to confirm the maximum test pressure a system can be subjected to in accordance with all applicable industry and site-specific standards.

⚠ It is recommended that water be used as the test medium. Venting all gases from the vessel being pressurized is necessary before pressurizing the system.

⚠ In the event pneumatic testing is required, all attempts to limit potential damage to any personnel or equipment must be made. USA Industries recommends Nitrogen as the medium for pneumatic testing as it does not support combustion. Follow provisions outlined in ASME PCC-2 Repair of Pressure Equipment and Piping when testing pneumatically.

⚠ The Double Block and Bleed GripSafe Plug is designed to hold pressure originating from the vessel side and Between the Seal area only.

⚠ Careful observation is needed at the location of the pipe where the Wedge Grippers make contact while performing a hydrotest. If any deformation or swelling of the pipe is observed, stop immediately and slowly release the pressure from the system. Contact USA Industries for further assistance.

⚠ At any time during hydrotesting, if a popping or clicking sound is heard, stop immediately and slowly release the pressure from the system. Popping or clicking sounds during hydrotesting could be a sign of the Wedge Gripper slipping, cracking, or plug components failing. Remove the plug from the pipe or fitting and inspect for damage. Contact USA Industries for further assistance.

⚠ Ensure plug is clean of debris, fouling, and contaminants before each use. Each Wedge Grippers should freely slide up and down in its slots with a full range of motion without any resistance. With impeded movement due to debris, dirt, contaminants, or other fouling will cause the plug to not grip on the pipe's inner diameter, which can cause it to eject under pressure, leading to personnel injury or death, material loss, and damage to equipment.

⚠ For any questions or concerns, contact USA Industries for technical assistance.

3. Parts

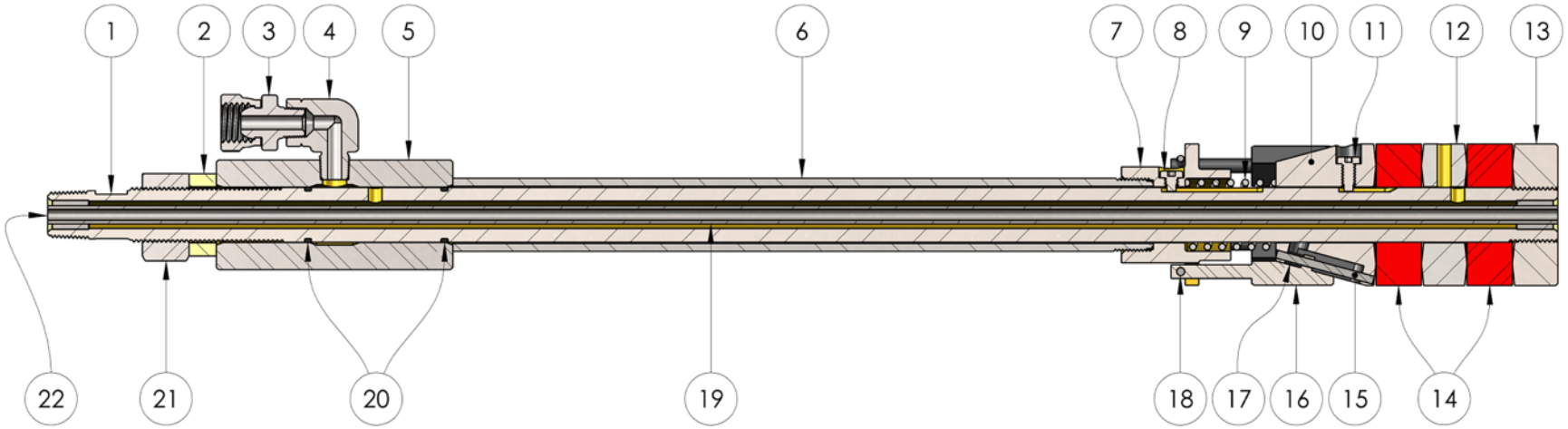

Figure 1: GripSafe ST Double Block and Bleed ¾”-2” (DBB) Diagram

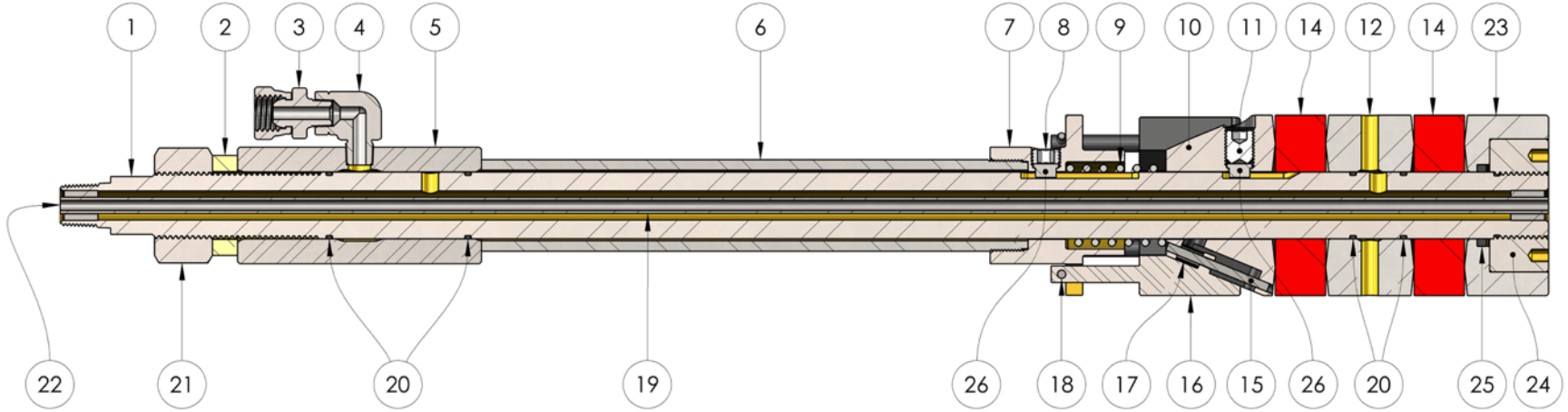

Figure 2: GripSafe ST Double Block and Bleed 2-1/2”- 4” (DBB) Diagram

Table 1: GripSafe® Bill Of Materials

Nominal Pipe Size (in)	Schedule	(1) Shaft	(2) Thrust Washer	(3) Swivel Pipe Union Fitting	(4) Street Elbow Fitting	(5) DBB Pressure Fill Sleeve	(6) Compression Tube	(7) DBB Spring Plate	(8) Spring Plate Alignment Screw	(9) Retraction Spring	(10) Wedge Cone	(11) Wedge Cone Alignment Screw	(12) Mid Ring	(13) Bottom Compression Plate	(14) Seal	(15) Wedge Gripper Retaining Dowel Pin	(16) Wedge Gripper	(17) Wedge Gripper Spring	(18) Wedge Gripper Stem Dowel Pin	(19) DBB Shaft Internal Plumbing	(20) DBB Shaft O-Ring	(21) Compression Hex Nut	(22) Vent Port	(23) Sealing Compression Ring	(24) O-Ring Compression Threaded Insert	(25) Compression Ring O-Ring	(26) Spring Plate and Wedge Cone Alignment Key
3/4	40,STD,40S	1	1	1	1	1	1	1	0	1	1	1	1	1	2	5	5	5	5	1	2	1	1	0	0	0	0
	80,XS,80S	1	1	1	1	1	1	1	0	1	1	1	1	1	2	5	5	5	5	1	2	1	1	0	0	0	0
1	10	1	1	1	1	1	1	1	0	1	1	1	1	1	2	6	6	6	6	1	2	1	1	0	0	0	0
	40,STD,40S	1	1	1	1	1	1	1	0	1	1	1	1	1	2	5	5	5	5	1	2	1	1	0	0	0	0
	80,XS,80S	1	1	1	1	1	1	1	0	1	1	1	1	1	2	5	5	5	5	1	2	1	1	0	0	0	0
	160	1	1	1	1	1	1	1	0	1	1	1	1	1	2	5	5	5	5	1	2	1	1	0	0	0	0
1-1/4	10	1	1	1	1	1	1	1	1	1	1	1	1	1	2	7	7	7	7	1	2	1	1	0	0	0	0
	40,STD,40S	1	1	1	1	1	1	1	1	1	1	1	1	1	2	6	6	6	6	1	2	1	1	0	0	0	0
	80,XS,80S	1	1	1	1	1	1	1	1	1	1	1	1	1	2	5	5	5	5	1	2	1	1	0	0	0	0
	160	1	1	1	1	1	1	1	0	1	1	1	1	1	2	6	6	6	6	1	2	1	1	0	0	0	0
	XX	1	1	1	1	1	1	1	0	1	1	1	1	1	2	6	6	6	6	1	2	1	1	0	0	0	0
1-1/2	10	1	1	1	1	1	1	1	1	1	1	1	1	1	2	7	7	7	7	1	2	1	1	0	0	0	0
	40,STD,40S	1	1	1	1	1	1	1	1	1	1	1	1	1	2	6	6	6	6	1	2	1	1	0	0	0	0
	80,XS,80S	1	1	1	1	1	1	1	1	1	1	1	1	1	2	5	5	5	5	1	2	1	1	0	0	0	0
	160	1	1	1	1	1	1	1	1	1	1	1	1	1	2	6	6	6	6	1	2	1	1	0	0	0	0
	XX	1	1	1	1	1	1	1	0	1	1	1	1	1	2	6	6	6	6	1	2	1	1	0	0	0	0
2	10	1	1	1	1	1	1	1	1	1	1	1	1	1	2	7	7	7	7	1	2	1	1	0	0	0	0
	40,STD,40S	1	1	1	1	1	1	1	1	1	1	1	1	1	2	6	6	6	6	1	2	1	1	0	0	0	0
	80,XS,80S	1	1	1	1	1	1	1	1	1	1	1	1	1	2	6	6	6	6	1	2	1	1	0	0	0	0
	160	1	1	1	1	1	1	1	1	1	1	1	1	1	2	7	7	7	7	1	2	1	1	0	0	0	0
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2-1/2	10	1	1	1	1	1	1	1	1	1	1	1	1	1	2	7	7	7	7	1	4	1	1	1	1	1	2
	40,STD,40S	1	1	1	1	1	1	1	1	1	1	1	1	1	2	6	6	6	6	1	4	1	1	1	1	1	2
	80,XS,80S	1	1	1	1	1	1	1	1	1	1	1	1	1	2	6	6	6	6	1	4	1	1	1	1	1	2
	160	1	1	1	1	1	1	1	1	1	1	1	1	1	2	7	7	7	7	1	2	1	1	0	0	0	0
	XX	1	1	1	1	1	1	1	1	1	1	1	1	1	2	7	7	7	7	1	2	1	1	0	0	0	0
3	10	1	1	1	1	1	1	1	1	1	1	1	1	1	2	8	8	8	8	1	4	1	1	1	1	1	2
	40,STD,40S	1	1	1	1	1	1	1	1	1	1	1	1	1	2	7	7	7	7	1	4	1	1	1	1	1	2
	80,XS,80S	1	1	1	1	1	1	1	1	1	1	1	1	1	2	7	7	7	7	1	4	1	1	1	1	1	2
	160	1	1	1	1	1	1	1	1	1	1	1	1	1	2	7	7	7	7	1	4	1	1	1	1	1	2
	XX	1	1	1	1	1	1	1	1	1	1	1	1	1	2	7	7	7	7	1	4	1	1	1	1	1	2
3-1/2	10	1	1	1	1	1	1	1	1	1	1	1	1	1	2	8	8	8	8	1	4	1	1	1	1	1	2
	40,STD,40S	1	1	1	1	1	1	1	1	1	1	1	1	1	2	7	7	7	7	1	4	1	1	1	1	1	2
	80,XS,80S	1	1	1	1	1	1	1	1	1	1	1	1	1	2	7	7	7	7	1	4	1	1	1	1	1	2
	XX	1	1	1	1	1	1	1	1	1	1	1	1	1	2	6	6	6	6	1	4	1	1	1	1	1	2
4	10	1	1	1	1	1	1	1	1	1	1	1	1	1	2	8	8	8	8	1	4	1	1	1	1	1	2
	40,STD,40S	1	1	1	1	1	1	1	1	1	1	1	1	1	2	7	7	7	7	1	4	1	1	1	1	1	2
	80,XS,80S	1	1	1	1	1	1	1	1	1	1	1	1	1	2	7	7	7	7	1	4	1	1	1	1	1	2
	120	1	1	1	1	1	1	1	1	1	1	1	1	1	2	7	7	7	7	1	4	1	1	1	1	1	2
	160	1	1	1	1	1	1	1	1	1	1	1	1	1	2	7	7	7	7	1	4	1	1	1	1	1	2
	XX	1	1	1	1	1	1	1	1	1	1	1	1	1	2	7	7	7	7	1	4	1	1	1	1	1	2

4. Specifications

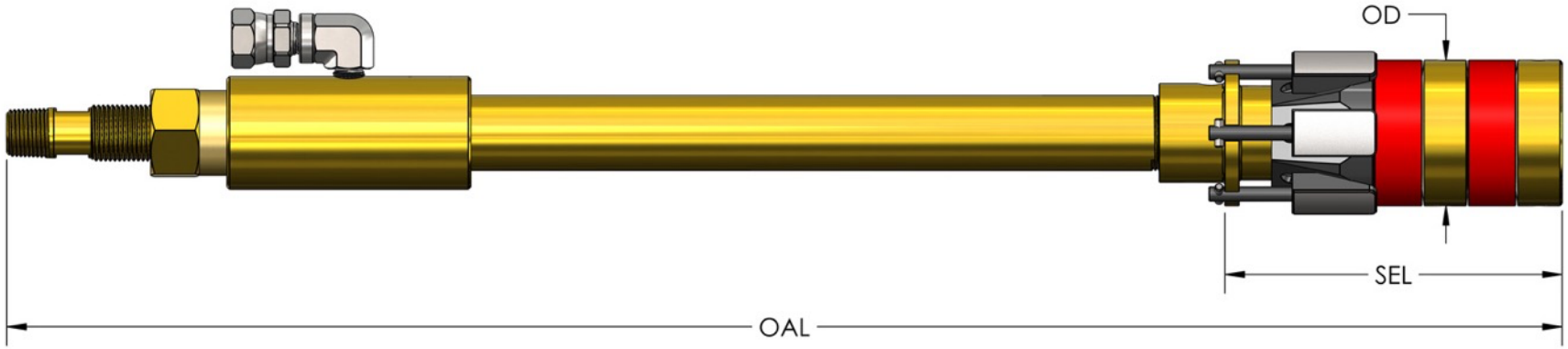

Figure 3: GripSafe ST Double Block and Bleed Diagram (DBB) Dimensions

Table 2: GripSafe ST DBB Plug Specifications

Nominal Pipe Size (in)	Schedule	Part Number	Tool Diameter (in)	Rec. ID Range* (in)	Nominal Pipe ID Clearance (in)	Approx. Tool Weight (lbs)	Tool Length (in)	Torque Range (ft-lbs)		Compression Hex Nut Size (in)	Backup Wrench Size (in)	Fill Port Thread	Back Pressure Vent Thread	Back Pressure Rating (PSI)	Between the Seal Test Pressure (PSI)	SEL Seal End Length
								Norm	Max.							
3/4	40,STD,40S	GSST-D-S-0075-040	0.79	0.80 - 0.87	0.035	1.9	19.00	2.9	4.5	1/2	1/4 Open End	1/4 FNPSM	1/4 MNPT	10000	2500	2.92
	80,XS,80S	GSST-D-S-0075-080	0.71	0.72 - 0.79	0.035	1.9	19.00	2.2	3.5	1/2	1/4 Open End	1/4 FNPSM	1/4 MNPT	10000	2500	2.92
1	10	GSST-D-S-0100-010	1.04	1.06 - 1.16	0.055	2.2	18.63	6.3	9.7	9/16	1/4 Open End	1/4 FNPSM	1/16 MNPT	10000	2500	3.17
	40,STD,40S	GSST-D-S-0100-040	0.99	1.02 - 1.11	0.055	2.2	18.63	5.6	8.7	9/16	1/4 Open End	1/4 FNPSM	1/16 MNPT	10000	2500	3.17
	80,XS,80S	GSST-D-S-0100-080	0.90	0.92 - 1.02	0.055	2.1	18.63	4.5	6.9	9/16	1/4 Open End	1/4 FNPSM	1/16 MNPT	10000	2500	3.17
	160	GSST-D-S-0100-160	0.78	0.79 - 0.85	0.035	1.9	19.00	2.8	4.4	1/2	1/4 Open End	1/4 FNPSM	1/4 MNPT	10000	2500	2.92
1 1/4	10	GSST-D-S-0125-010	1.38	1.39 - 1.54	0.068	3.9	19.00	15	23	3/4	3/8 Open End	1/4 FNPSM	1/8 MNPT	10000	2500	3.59
	40,STD,40S	GSST-D-S-0125-040	1.31	1.33 - 1.48	0.068	3.8	19.00	13	20	3/4	3/8 Open End	1/4 FNPSM	1/8 MNPT	10000	2500	3.59
	80,XS,80S	GSST-D-S-0125-080	1.21	1.23 - 1.38	0.065	3.6	19.00	11	17	3/4	3/8 Open End	1/4 FNPSM	1/8 MNPT	10000	2500	3.59
	160	GSST-D-S-0125-160	1.11	1.12 - 1.22	0.055	2.3	18.63	7.2	11	9/16	1/4 Open End	1/4 FNPSM	1/16 MNPT	10000	2500	3.17
	XX	GSST-D-S-0125-XX	0.86	0.87 - 0.94	0.045	1.9	19.00	3.5	5.5	1/2	1/4 Open End	1/4 FNPSM	1/4 MNPT	10000	2500	2.92
1 1/2	10	GSST-D-S-0150-010	1.60	1.64 - 1.80	0.085	5.2	20.00	24	37	15/16	7/16 Open End	1/4 FNPSM	1/4 MNPT	10000	2500	4.31
	40,STD,40S	GSST-D-S-0150-040	1.53	1.56 - 1.73	0.085	5.0	20.00	21	33	15/16	7/16 Open End	1/4 FNPSM	1/4 MNPT	10000	2500	4.31
	80,XS,80S	GSST-D-S-0150-080	1.42	1.45 - 1.62	0.085	4.8	20.00	18	28	15/16	7/16 Open End	1/4 FNPSM	1/4 MNPT	10000	2500	4.31
	160	GSST-D-S-0150-160	1.27	1.30 - 1.44	0.068	3.7	19.00	12	19	3/4	3/8 Open End	1/4 FNPSM	1/8 MNPT	10000	2500	3.59
	XX	GSST-D-S-0150-XX	1.05	1.08 - 1.16	0.055	2.2	18.63	6.3	9.8	9/16	1/4 Open End	1/4 FNPSM	1/16 MNPT	10000	2500	3.17
2	10	GSST-D-S-0200-010	2.03	2.05 - 2.28	0.130	6.8	20.75	47	75	1-1/8	9/16 Open End	1/4 FNPSM	3/8 MNPT	10000	2500	4.50
	40,STD,40S	GSST-D-S-0200-040	1.94	1.97 - 2.19	0.130	6.6	20.75	42	65	1-1/8	9/16 Open End	1/4 FNPSM	3/8 MNPT	10000	2500	4.50
	80,XS,80S	GSST-D-S-0200-080	1.81	1.84 - 2.06	0.130	6.2	20.75	36	55	1-1/8	9/16 Open End	1/4 FNPSM	3/8 MNPT	10000	2500	4.50
	160	GSST-D-S-0200-160	1.60	1.64 - 1.80	0.085	5.2	20.00	24	37	15/16	7/16 Open End	1/4 FNPSM	1/4 MNPT	10000	2500	4.31
	XX	GSST-D-S-0200-XX	1.42	1.45 - 1.62	0.085	4.8	20.00	18	28	15/16	7/16 Open End	1/4 FNPSM	1/4 MNPT	10000	2500	4.31
2 1/2	10	GSST-D-S-0250-010	2.51	2.57 - 2.77	0.125	10.6	21.38	85	135	1-5/16	9/16 Open End	1/4 FNPSM	3/8 MNPT	8000	2500	6.09
	40,STD,40S	GSST-D-S-0250-040	2.34	2.38 - 2.61	0.125	9.9	21.38	75	115	1-5/16	9/16 Open End	1/4 FNPSM	3/8 MNPT	8000	2500	6.09
	80,XS,80S	GSST-D-S-0250-080	2.20	2.24 - 2.46	0.125	9.4	21.38	65	100	1-5/16	9/16 Open End	1/4 FNPSM	3/8 MNPT	8000	2500	6.09
	160	GSST-D-S-0250-160	2.00	2.06 - 2.25	0.125	6.8	20.75	46	70	1-1/8	9/16 Open End	1/4 FNPSM	3/8 MNPT	10000	2500	4.50
	XX	GSST-D-S-0250-XX	1.69	1.74 - 1.89	0.085	5.4	20.00	27	42	15/16	7/16 Open End	1/4 FNPSM	1/4 MNPT	10000	2500	4.31
3	10	GSST-D-S-0300-010	3.07	3.10 - 3.44	0.193	15.1	22.13	150	230	1-1/2	3/4 Box End	1/4 FNPSM	3/8 MNPT	8000	2500	6.56
	40,STD,40S	GSST-D-S-0300-040	2.88	2.92 - 3.25	0.193	14.1	22.13	130	200	1-1/2	3/4 Box End	1/4 FNPSM	3/8 MNPT	8000	2500	6.56
	80,XS,80S	GSST-D-S-0300-080	2.71	2.75 - 3.09	0.190	13.2	22.13	110	175	1-1/2	3/4 Box End	1/4 FNPSM	3/8 MNPT	8000	2500	6.56
	160	GSST-D-S-0300-160	2.50	2.56 - 2.76	0.125	10.5	21.38	85	130	1-5/16	9/16 Open End	1/4 FNPSM	3/8 MNPT	8000	2500	6.09
	XX	GSST-D-S-0300-XX	2.18	2.24 - 2.42	0.125	9.3	21.38	55	85	1-1/8	9/16 Open End	1/4 FNPSM	3/8 MNPT	8000	2500	6.09
3 1/2	10	GSST-D-S-0350-010	3.56	3.61 - 3.96	0.204	20.4	22.75	225	350	1-11/16	7/8 Box End	1/4 FNPSM	1/2 MNPT	6000	2500	7.22
	40,STD,40S	GSST-D-S-0350-040	3.34	3.39 - 3.75	0.204	19.0	22.75	195	305	1-11/16	7/8 Box End	1/4 FNPSM	1/2 MNPT	6000	2500	7.22
	80,XS,80S	GSST-D-S-0350-080	3.16	3.21 - 3.56	0.208	17.7	22.75	175	270	1-11/16	7/8 Box End	1/4 FNPSM	1/2 MNPT	6000	2500	7.22
	XX	GSST-D-S-0350-0XX	2.60	2.66 - 2.86	0.125	10.9	21.38	95	145	1-5/16	9/16 Open End	1/4 FNPSM	3/8 MNPT	8000	2500	6.09
4	10	GSST-D-S-0400-010	4.04	4.10 - 4.51	0.220	27.9	23.25	325	505	1-7/8	15/16 Box End	1/4 FNPSM	1/2 MNPT	6000	2500	7.97
	40,STD,40S	GSST-D-S-0400-040	3.81	3.87 - 4.28	0.220	25.9	23.25	285	445	1-7/8	15/16 Box End	1/4 FNPSM	1/2 MNPT	6000	2500	7.97
	80,XS,80S	GSST-D-S-0400-080	3.61	3.67 - 4.08	0.220	24.2	23.25	255	395	1-7/8	15/16 Box End	1/4 FNPSM	1/2 MNPT	6000	2500	7.97
	120	GSST-D-S-0400-120	3.42	3.52 - 3.83	0.205	19.5	22.75	205	320	1-11/16	7/8 Box End	1/4 FNPSM	1/2 MNPT	6000	2500	7.22
	160	GSST-D-S-0400-160	3.23	3.33 - 3.64	0.205	18.3	22.75	185	285	1-11/16	7/8 Box End	1/4 FNPSM	1/2 MNPT	6000	2500	7.22
	XX	GSST-D-S-0400-XX	2.96	2.99 - 3.34	0.193	14.4	22.13	135	215	1-1/2	3/4 Box End	1/4 FNPSM	3/8 MNPT	8000	2500	6.56

5. Preparing the GripSafe ST DBB Plug for Installation

5.1 The GripSafe ST DBB plug should be in the Retracted position (Not Ready to Install) from the factory, see Figure 4.

Figure 4: Not Ready to Install State (Retracted)

Figure 5: Ready to Install State (Compressed)

5.2 Tighten the ***Compression Hex Nut(21)*** so that the ***DBB Spring Plate(3)*** is flush the ***Wedge Cone(10)***, see Figure 5.

- Do not over tighten or torque the ***Compression Hex Nut(21)*** to the point that the ***Seals(14)*** start to swell or extrude over the OD of the plug.
- In the Compressed state, shown in Figure 5, the GripSafe Plug will immediately grip on the pipe upon insertion.

CHECK: Ensure plug is clean of debris, fouling, and contaminants before each use. Each ***Wedge Gripper(16)*** should slide freely up and down in its slot with a full range of motion and without resistance. ***Wedge Gripper(16)*** with impeded movement due to debris, dirt, contaminants or other fouling will cause the plug to not grip on the pipe's inner diameter, which can cause the plug to eject under pressure, leading to personnel injury or death, material loss, and damage to equipment.

6. Installing the GripSafe ST DBB Plug

CAUTION: Ensure pipe I.D. is clean. Debris, pipe scaling, and rust layer must be removed to the deepest point the plug will be installed into. If the pipe is lined or has irremovable product, ***STOP*** and contact USA Industries for support before proceeding. Failure to do so may impede the wedge's ability to grip and cause the plug to eject under pressure. Be sure to wear proper PPE and follow all site guidelines.

6.1 Inserting the GripSafe ST DBB plug into the pipe.

- See Table 2 for clearance requirements and ensure the pipe ID falls within the Internal Diameter Range.

6.2 Slowly push the plug into the pipe.

6.3 A slight rocking motion will assist installation.

- Once the ***Wedge Grippers(16)*** contact the inner diameter of the pipe, it will automatically grip and removal of the plug at this point is not possible, see Section 8 for plug removal if necessary.

6.4 For pipe installation, push the GripSafe ST DBB plug further into the pipe to the desired depth. The top of the ***DBB Spring Plate's(7)*** slotted section must not be protruding past the face of the pipe it is installed in. See Figure 6 for properly installed plug and Figure 7 for improperly installed plug. The top of the ***DBB Spring Plate's(3)*** slotted section can be inserted further into the pipe if necessary. For a welding neck installation, see Section 7.

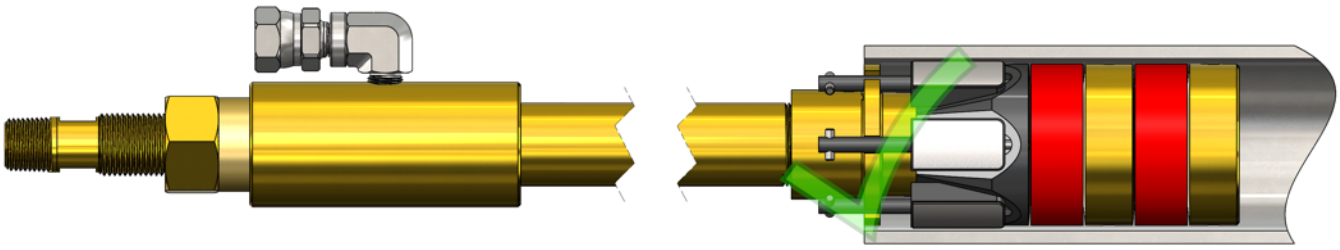

Figure 6: GripSafe ST DBB Minimum Insertion Depth in a Sectioned Pipe

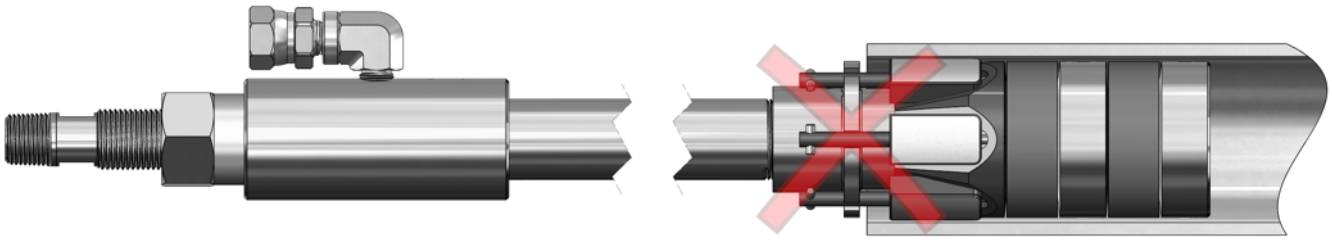

Figure 7: GripSafe ST DBB incorrect Insertion Depth in a Sectioned Pipe

6.5 Use a crow's foot attached to a torque wrench to torque the ***Compression Hex Nut(21)*** while holding the Backup Hex or flats on the ***Shaft(1)*** stationary with a wrench until the Minimum Compression Torque (Table 2) is reached.

TEMPERATURE NOTE: If welding is to occur on the pipe while the plug is installed, the ***Seal(9)*** should be installed a minimum of 6" from the center of an active weld to prevent it from degrading or ultimately failing due to melting. For post weld heat treats, bake-outs, etc., the ***Seal(14)*** should be at least 12" from the nearest edge of the heating element, and the temperature at the depth the plug is installed at should not exceed 220° F. If a high temperature bake out is being performed (400° F or higher) increase the installation depth as much as possible. It is recommended to always monitor the pressure behind the plug (ORB) and/or between the seals (DBB) and stop work immediately if any pressure drop is detected. In addition, the pipe's external surface temperature should always be monitored corresponding to the plug's seal location to ensure damage to the seal does not occur.

CAUTION: Using an impact wrench is not recommended as it can damage both the ***Spring Plate Alignment Screw(8)*** and ***Wedge Cone Alignment Screw(11)*** for sizes ¾" – 2" or ***Spring Plate and Wedge Cone Alignment Key(26)*** for sizes 2-1/2" and above.

CAUTION: Failure to use a backup wrench to keep the shaft stationary will place excessive stress on the ***Wedge Cone Alignment Screw(11)*** for sizes ¾" – 2", or ***Spring Plate and Wedge Cone Alignment Key(26)*** for sizes 2-1/2" and above, which could cause failure, resulting in a stuck plug and/or cause it to eject under pressure.

6.6 Verify integrity of the ***Seals(14)***

6.7 Use proper fittings to install a manual hydrotest pump to the ***Swivel Pipe Union Fitting(3)***.

- Pressurize to 500 psig or 75% of target pressure for 10 minutes to ensure both ***Seals(14)*** are seated. Then proceed to desired pressure. Observance of pressure drop may not be an indication of leakage. USA Industries ***Seals(14)*** will creep under pressure until they are fully seated. This creep will increase the pressure test volume. Depending on the test volume size, this may be by such a trivial amount it will not be seen on a gauge. For relatively small test volumes a noticeable gradual loss in pressure may be observed during this creep phase. Seating the ***Seals(14)*** is obtained by reapplying pressure until the pressure becomes stable. This seal creep may also be observed when the system is subjected to the full pressure. Resolution to the creep is the same at high pressure and while verifying integrity.

6.8 The GripSafe ST DBB plug is now safely installed to accept rated hydrotest and backpressure pressures.

- It may be desirable to attach a gauge and vent hose assembly, backpressure monitoring tee, to the backpressure ***Vent Port(22)*** to bleed off any backpressure. The hose should be long enough to redirect any vapor coming out of the vessel to a safe location away from workers that may be in the area. A valve may also be attached to this port to allow safe backpressure removal during plug removal, *Section 8*. If using a backpressure monitoring tee it may be useful to have a pressure gauge on the bull side of the tee while connecting the run side to the backpressure ***Vent Port(22)*** and a ball valve. Further advantages can be made by attaching a hose to the ball valve on the monitoring tee and running the hose to vent to a safe location away from workers that may be in the area.

CAUTION: Fast flowing gases or liquids through hosing can cause hose whip. Take caution to avoid this, failure to do so may result in injury to personnel or damage to equipment.

CAUTION: Do not stand directly in front of the GripSafe ST Double Block and Bleed at any time. Installed plugs should always be treated in this manner irrespective if the plug has backpressure on it or not.

CAUTION: If backpressure develops, constant observation of pressure observed through the use of an attached gauge and physical observation of pipe integrity is necessary to ensure safety to personnel and equipment. Any bulging, enlargement or tapering of the pipe is an indication of over pressuring. The Backpressure Rating listed in Table 2 is for the pressure holding capability of the GripSafe ST Double Block and Bleed and could be well beyond the system design limitations in which it is being used to test.

7. Positioning for Between the Seal Hydrotesting

7.1 If using the plug to hydrostatically test a weld, ensure proper Depth of Insertion by using the following method:

1. Measure the ***Weld Zone Depth***, distance from the pipe or fitting end to the center of weld area to be tested.
2. Measure the ***Mid Ring's(12)*** center distance, distance from the top of the ***Compression Hex Nut(21)*** to the center distance of the ***Mid Ring(12)***. Note: When measuring the center distance of the ***Mid Ring(12)***, make sure that the plug is in the Compressed state as shown in Figure 5.
3. Subtract the Weld Zone Depth from the ***Mid Ring's(12)*** center distance.
4. Insert the plug while measuring from the pipe or fitting end to the top of the ***Compression Hex Nut(21)*** and stop inserting when the reading on the measuring tape matches the difference found in step 3 of this subsection.

   Example:

   Mid Ring's(12) Center Distance = 17.25"

   Weld Zone Depth = 2.53"

   Mid Ring's(12) Center Distance – ***Weld Zone Depth*** = 17.25" – 2.53" = 14.72"

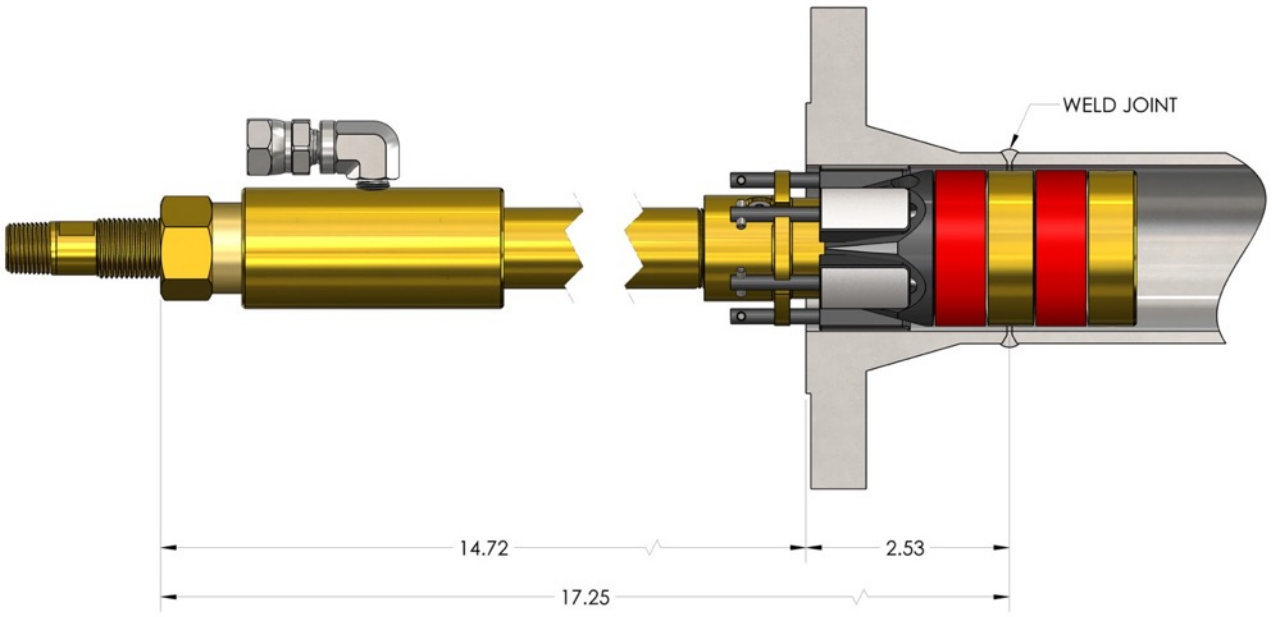

Figure 8: Insertion Depth for Testing Weld

5. From the calculation, and as shown in Figure 8, the plug should be inserted into the fitting until the distance from the top of the ***Compression Hex Nut(21)*** to the end of the fitting is 14.72”.

CAUTION: Gripping failure may occur if the Gripping Wedges are not fully inserted into the pipe or fitting. If any of the ***Wedge Gripper’s(16)*** surface is visible beyond the end of the pipe or fitting end, represented in Figure 10, the GripSafe plug may not hold any backpressure. Advancement of the plug into the vessel being tested is necessary so none of the ***Wedge Gripper’s(16)*** surface is visible beyond the end of the pipe or fitting end shown in Figure 9. Care should be taken to not cover the weld area with the ***Seal(14)*** as it could render a false outcome of a hydrotest.

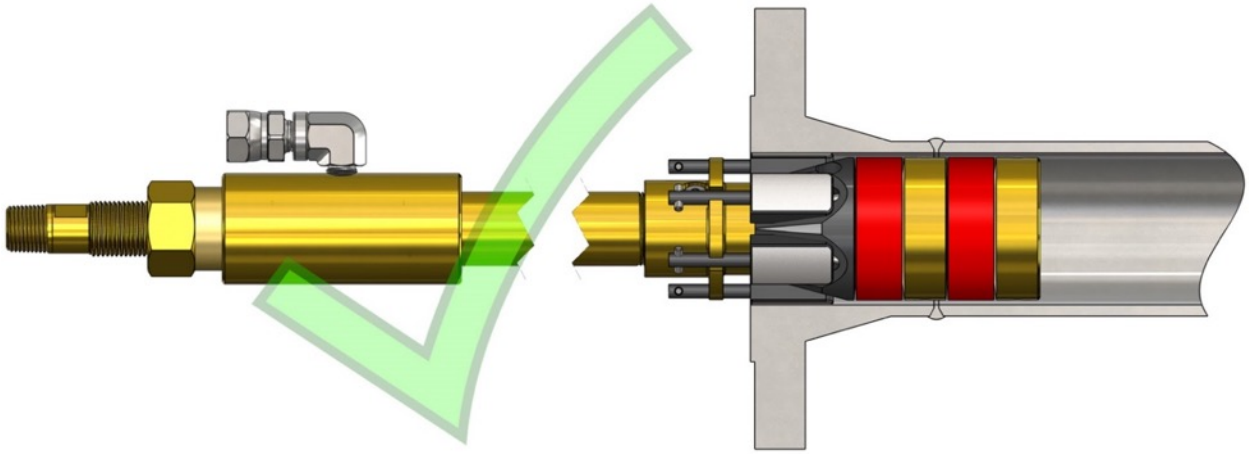

Figure 9: Permissible Insertion Depth with Backpressure Rating

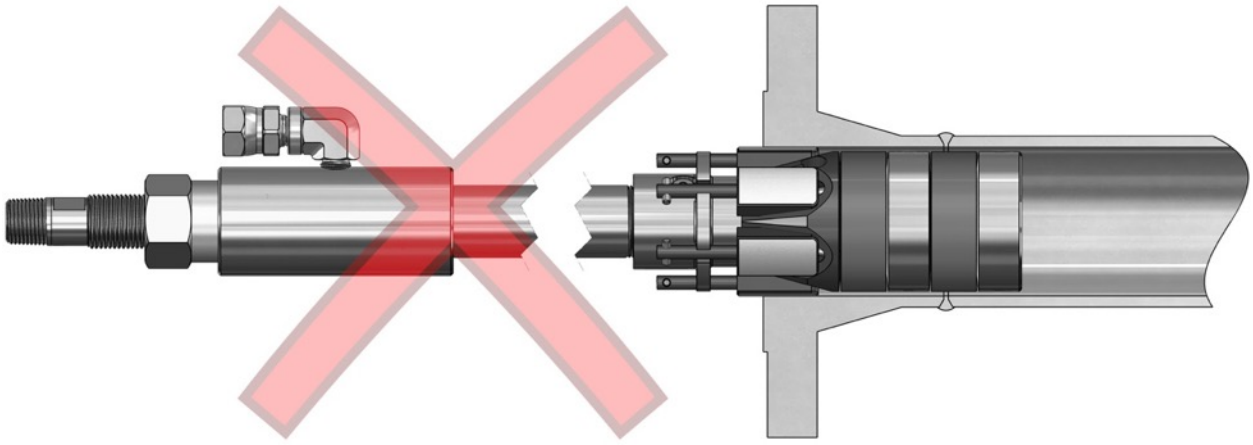

Figure 10: Impermissible Insertion Depth with No Backpressure Rating

8. Removal of GripSafe ST DBB Plug

8.1 Depressurize system through hydrotest pump's bleed off valve.

8.2 Remove hydrotest equipment from the ***Swivel Pipe Union Fitting(3)***.

NOTE: Use caution to ensure the ***Swivel Pipe Union Fitting(3)*** does not become unthreaded or loosened during removal of the hydrotesting equipment when testing is complete. Failure to do so may cause leaks when the plug is used again. Use appropriately fixed size wrenches, not adjustable wrenches.

8.3 Ensure there is no backpressure on the GripSafe ST DBB plug.

CAUTION: SLOWLY open ***Vent Port(22)*** to relieve any back pressure. Care must be taken when opening valves or loosening fittings if any inadvertent backpressure was introduced to the vessel. Failure to do so may result in hazardous pressure flow and/or fittings becoming violently hazardous projectiles that may cause injury to personnel and damage to equipment. If utilizing a backpressure monitoring tee, fast flowing gases or liquids through hosing can cause hose whip. Take caution to avoid this, failure to do so may result in injury to personnel and damage to equipment.

8.4 Loosen the ***Compression Hex Nut(21)***.

- Once the seal has broken free from the pipe's inner diameter water may flow out from the pipe, be prepared to capture this if desired. Continue loosening the ***Compression Hex Nut(21)*** until the ***Wedge Grippers(16)*** are fully relaxed.

NOTE: Do not remove the ***Compression Nut(21)*** from the ***Shaft(1)***. If this happens, immediately reinstall the component.

8.5 Remove the GripSafe ST DBB plug from the pipe.

- Clean and store for later use or return to USA Industries.
- ***Wedge Grippers(16)*** texture may become plugged with pipe scale and rust through several uses of the plug. Inspection of this surface after each use is necessary to keep the gripping strength at peak performance. To clean, simply use mild dishwashing soap and a stiff stainless steel bristled brush such as a welding brush. If plugging is persistent, use of a household rust remover along with a stiff stainless steel bristled brush should be sufficient. Rinse plug clean of any residual chemicals with tap water and dry thoroughly.
- Inspect ***Wedge Grippers'(16)*** freedom of motion. Each ***Wedge Gripper(16)*** should slide freely up and down in its slot with a full range of motion and without resistance.
- Store out of direct sunlight in an area not exposed to above 150° F, UV light and excessive heat will cause ***Seal(14)*** degradation over time.

9. Installing and Using Safety Gag

NOTE: Safety Gags are not required but are recommended to provide a layer of protection in the unlikely event of plug discharge.

9.1 Slide the loosely assembled Safety Gag over the pipe before inserting the plug.

9.2 Follow the plug installation instructions in Sections 5-7 to install the GripSafe ST DBB before continuing to step 8.4.

9.3 Place the pear-shaped link over the ***Back Pressure Vent Port(22)***.

9.4 Push the clamp further down the pipe to remove all slack in the chain. Ensure that the chain is not snagged, twisted, or knotted, and is tight from the gag bolt to the pear-shaped link.

9.5 Starting with the two bolts nearest the pipe, snug all of the bolts on the clamp. For the two bolts nearest the pipe, turn an additional 1/3-1/2 turn.

- When properly installed, the Safety Gag should be firmly clamped and not be able to rotate, slide, or tilt in any fashion when pushed or pulled.
- See Figure 9 for an example of a properly installed Safety Gag.

9.6 Reverse steps 9.1-9.5 to uninstall.

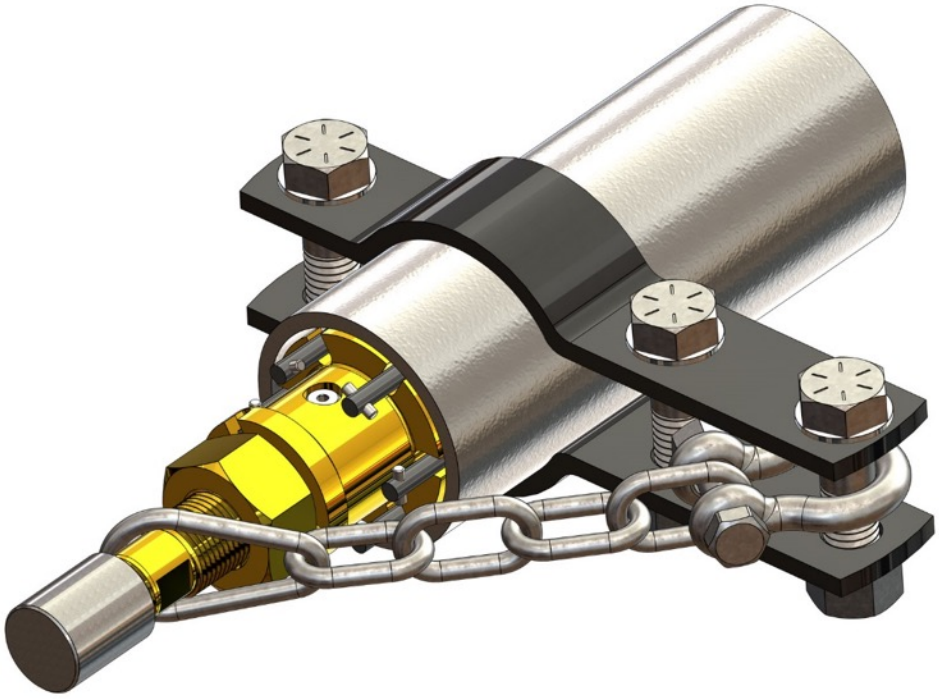

Figure 10: Properly Installed Safety Gag on Pipe

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