USA INDUSTRIES
SINCE 1982

GripSafe® ST

OPERATING MANUAL

Small Outboard Retraction Blocking (ORB) Plug

¾” – 4”*

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

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

For patent and trademark information, go to https//www.USAIndustries.com/gripsafe-patents/trademarks/

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1. Introduction

Thank you for selecting GripSafe ST pipe plugging technology. This manual provides guidelines for the correct use of the system to maintain safe operating conditions. USA Industries, LLC offers all required sockets and wrenches for installation, which are available for rent or purchase. Refer to Section 4, Table 2 for details on socket sizes.

The instructions in this manual apply specifically to the use of the GripSafe ST IIB plug in metallic piping. If you plan to use this plug in non-metallic piping, please contact USA Industries' Customer Service Department for technical assistance.

⚠ **Do not use the GripSafe ST equipment without thoroughly reading and understanding this manual**

⚠ **Failure to fully adhere to the instructions in this manual may lead to personnel injury and equipment damage.**

2. Safety

⚠ Failure to follow proper safety protocols may result in the GripSafe ST ORB plug malfunctioning, which can lead to personnel injury, material loss, and equipment damage.

⚠ Always wear appropriate PPE when handling the GripSafe ST ORB plug, as outlined by site safety guidelines. Follow all site procedures for safely lifting and operating equipment.

⚠ Do not install the GripSafe ST ORB plug if the Gripping Wedge would be positioned over a weld droop or ridge. Similarly, never install the Seals or Gripping Wedge over a section of pipe missing its interior wall, such as a weldolet or tee.

⚠ Handle the Wedge Studs with care. Avoid striking, hammering, or prying on the Wedge Studs, and never remove the nuts from the Wedge Studs.

⚠ Pressure testing is a hazardous procedure, and strict adherence to safety precautions is required. Never stand or walk in front of an installed test plug during testing. Do not adjust the plug, safety equipment, or vessel while the plug is pressurized.

⚠ Ensure that the plug's rated pressure, stamped on the plug, is not exceeded. Plugs are rated to hold pressure in only one direction, so never apply pressure on the non-rated side. The backpressure rating refers to the plug's ultimate holding capacity; do not exceed the pressure limit of the weakest component in the system. Before beginning a pressure test, review the system components to confirm the maximum allowable pressure in compliance with applicable industry and site standards.

⚠ Water is the recommended test medium, and all gases should be vented from the vessel before pressurization. If pneumatic testing is necessary, prioritize minimizing risks to personnel and equipment. USA Industries recommends using nitrogen for pneumatic tests, as it does not support combustion. When testing pneumatically, follow ASME PCC-2 guidelines for the repair of pressure equipment and piping.

⚠ The Outboard Retraction Blocking (ORB) GripSafe ST plug is designed to hold pressure only from the vessel side. During a hydrotest, carefully monitor the area where the Wedge Grippers make contact with the pipe. If any deformation or swelling of the pipe occurs, stop immediately and gradually release the pressure. Contact USA Industries for assistance.

⚠ If any popping or clicking sounds are heard during hydrotesting, stop immediately and slowly release the pressure. These sounds may indicate Wedge Gripper slippage, cracking, or component failure. Remove the plug and inspect it for damage, then contact USA Industries for support.

⚠ Before each use, ensure that the plug is free of debris, fouling, and contaminants. Each Wedge Gripper should move freely within its slot without resistance. Blocked movement due to debris or fouling may prevent the plug from gripping the pipe’s inner diameter, which could cause it to eject under pressure, leading to injury, death, material loss, or equipment damage.

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

3. Parts

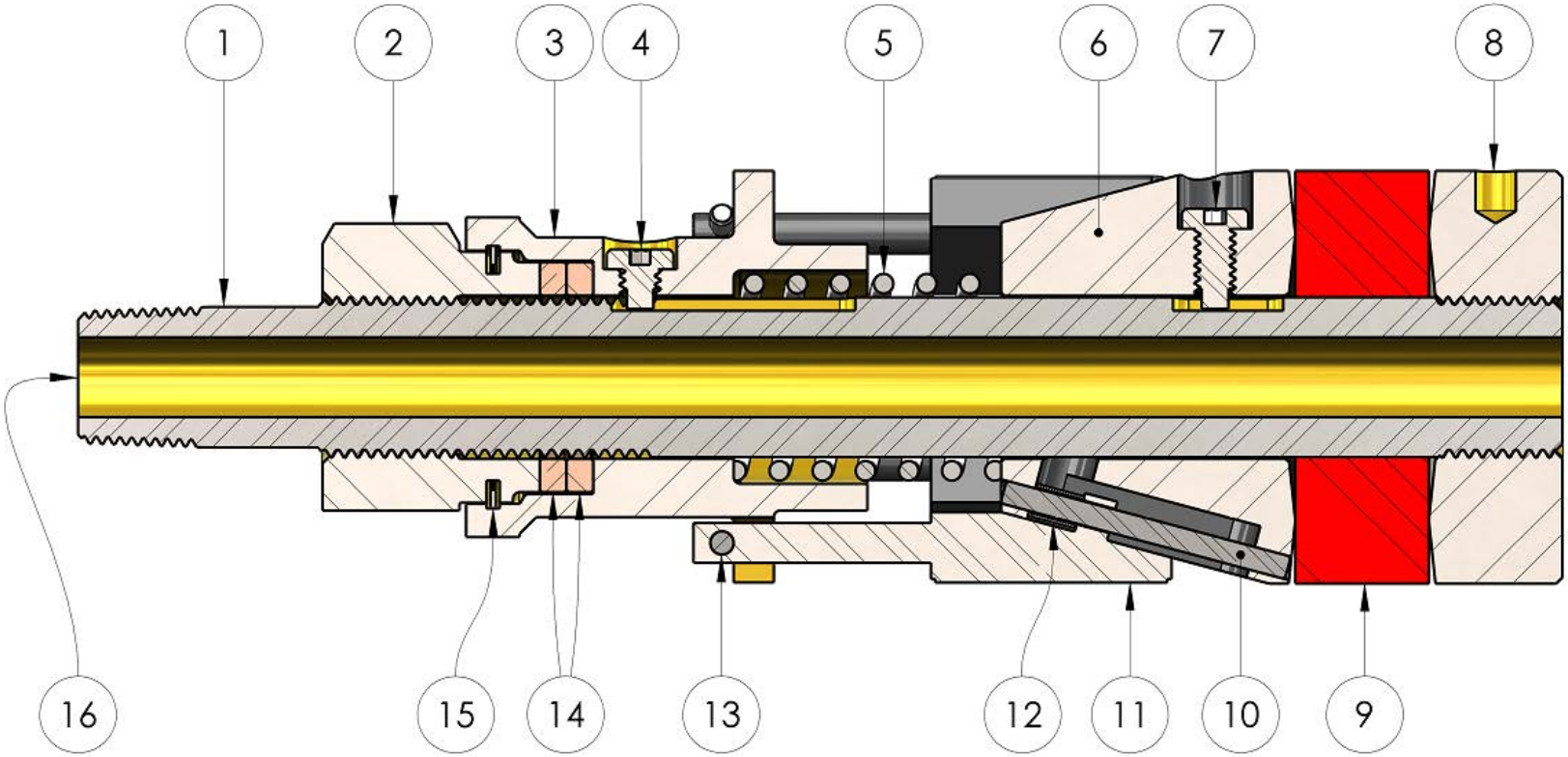

Figure 1: GripSafe ST Outboard Retraction Blocking 3/4” – 2” (ORB) Diagram

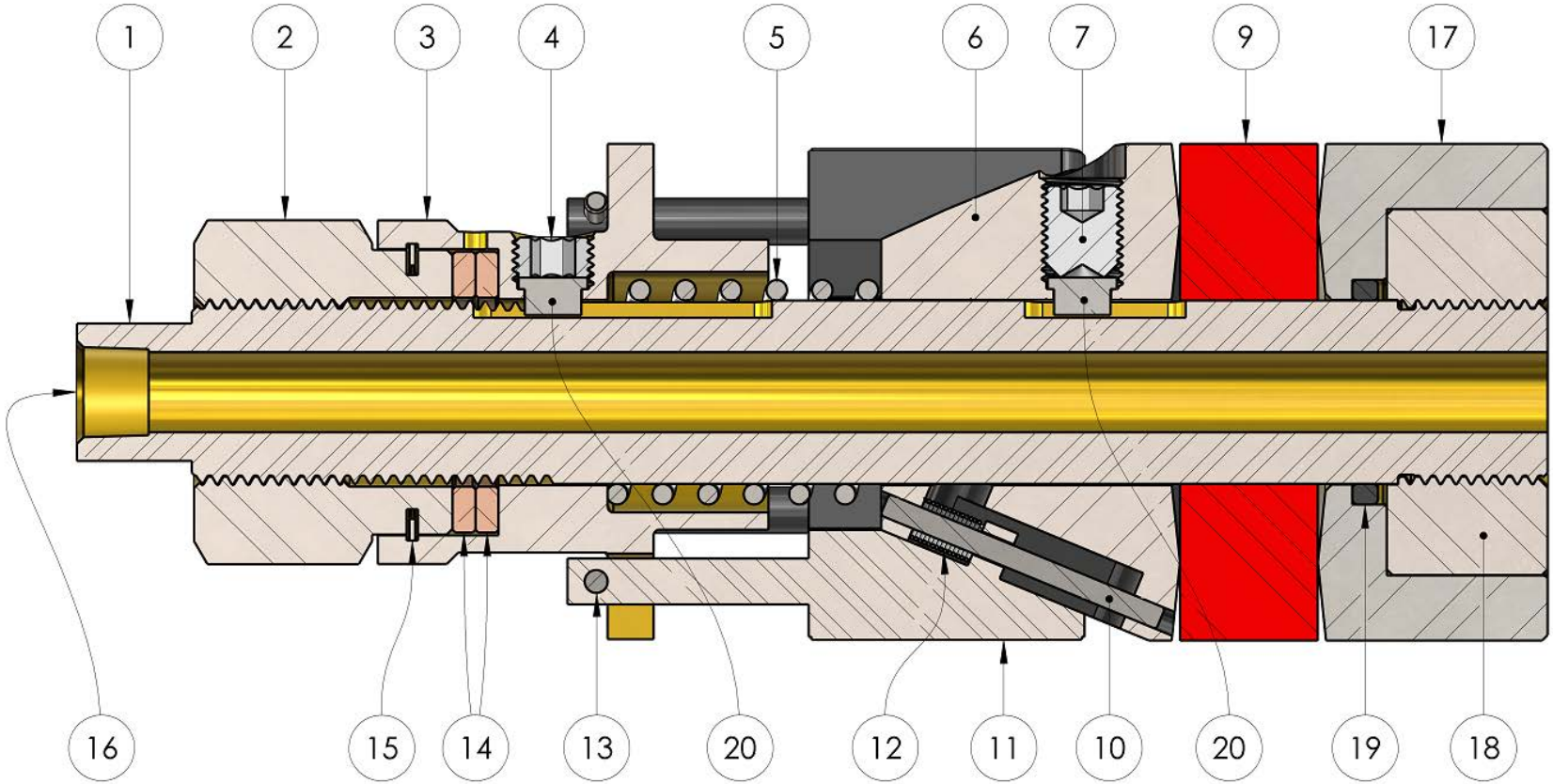

Figure 2: GripSafe ST Outboard Retraction Blocking 2-1/2” – 4” (ORB) Diagram

Table 1: GripSafe ST ORB Plug Bill Of Materials

Nominal Pipe Size (in)	Schedule	(1) Shaft	(2) Compression Hex Nut	(3) ORB Spring Plate	(4) Spring Plate Alignment Screw	(5) Retraction Spring	(6) Wedge Cone	(7) Wedge Cone Alignment Screw	(8) Bottom Compression Plate	(9) Seal	(10) Wedge Gripper Dowel Pin	(11) Wedge Gripper	(12) Wedge Gripper Spring	(13) Wedge Gripper Retaining Dowel Pin	(14) Thrust Bearing	(15) ORB Retaining Ring	(16) Vent Port	(17) Sealing Compression Ring	(18) O-Ring Compression Threaded insert	(19) Compression Ring O-Ring	(20) Spring Plate and Wedge Cone Alignment Key
3/4	40,STD,40S	1	1	1	0	1	1	1	1	1	5	5	5	5	1	1	1	0	0	0	0
	80,XS,80S	1	1	1	0	1	1	1	1	1	5	5	5	5	1	1	1	0	0	0	0
1	10	1	1	1	0	1	1	1	1	1	6	6	6	6	2	1	1	0	0	0	0
	40,STD,40S	1	1	1	0	1	1	1	1	1	5	5	5	5	2	1	1	0	0	0	0
	80,XS,80S	1	1	1	0	1	1	1	1	1	5	5	5	5	2	1	1	0	0	0	0
	160	1	1	1	0	1	1	1	1	1	5	5	5	5	1	1	1	0	0	0	0
1-1/4	10	1	1	1	1	1	1	1	1	1	7	7	7	7	2	1	1	0	0	0	0
	40,STD,40S	1	1	1	1	1	1	1	1	1	6	6	6	6	2	1	1	0	0	0	0
	80,XS,80S	1	1	1	1	1	1	1	1	1	5	5	5	5	2	1	1	0	0	0	0
	160	1	1	1	0	1	1	1	1	1	6	6	6	6	2	1	1	0	0	0	0
	XX	1	1	1	0	1	1	1	1	1	6	6	6	6	1	1	1	0	0	0	0
1-1/2	10	1	1	1	1	1	1	1	1	1	7	7	7	7	2	1	1	0	0	0	0
	40,STD,40S	1	1	1	1	1	1	1	1	1	6	6	6	6	2	1	1	0	0	0	0
	80,XS,80S	1	1	1	1	1	1	1	1	1	5	5	5	5	2	1	1	0	0	0	0
	160	1	1	1	1	1	1	1	1	1	6	6	6	6	2	1	1	0	0	0	0
	XX	1	1	1	0	1	1	1	1	1	6	6	6	6	2	1	1	0	0	0	0
2	10	1	1	1	1	1	1	1	1	1	7	7	7	7	2	1	1	0	0	0	0
	40,STD,40S	1	1	1	1	1	1	1	1	1	6	6	6	6	2	1	1	0	0	0	0
	80,XS,80S	1	1	1	1	1	1	1	1	1	6	6	6	6	2	1	1	0	0	0	0
	160	1	1	1	1	1	1	1	1	1	7	7	7	7	2	1	1	0	0	0	0
	XX	1	1	1	1	1	1	1	1	1	5	5	5	5	2	1	1	0	0	0	0
2-1/2	10	1	1	1	1	1	1	1	1	1	7	7	7	7	2	1	1	1	1	1	2
	40,STD,40S	1	1	1	1	1	1	1	1	1	6	6	6	6	2	1	1	1	1	1	2
	80,XS,80S	1	1	1	1	1	1	1	1	1	6	6	6	6	2	1	1	1	1	1	2
	160	1	1	1	1	1	1	1	1	1	7	7	7	7	2	1	1	0	0	0	0
	XX	1	1	1	1	1	1	1	1	1	7	7	7	7	2	1	1	0	0	0	0
3	10	1	1	1	1	1	1	1	1	1	8	8	8	8	2	1	1	1	1	1	2
	40,STD,40S	1	1	1	1	1	1	1	1	1	7	7	7	7	2	1	1	1	1	1	2
	80,XS,80S	1	1	1	1	1	1	1	1	1	7	7	7	7	2	1	1	1	1	1	2
	160	1	1	1	1	1	1	1	1	1	7	7	7	7	2	1	1	1	1	1	2
	XX	1	1	1	1	1	1	1	1	1	7	7	7	7	2	1	1	1	1	1	2
3-1/2	10	1	1	1	1	1	1	1	1	1	8	8	8	8	2	1	1	1	1	1	2
	40,STD,40S	1	1	1	1	1	1	1	1	1	7	7	7	7	2	1	1	1	1	1	2
	80,XS,80S	1	1	1	1	1	1	1	1	1	7	7	7	7	2	1	1	1	1	1	2
	XX	1	1	1	1	1	1	1	1	1	6	6	6	6	2	1	1	1	1	1	2
4	120	1	1	1	1	1	1	1	1	1	7	7	7	7	2	1	1	1	1	1	2
	160	1	1	1	1	1	1	1	1	1	7	7	7	7	2	1	1	1	1	1	2
	XX	1	1	1	1	1	1	1	1	1	7	7	7	7	2	1	1	1	1	1	2

4. Specifications

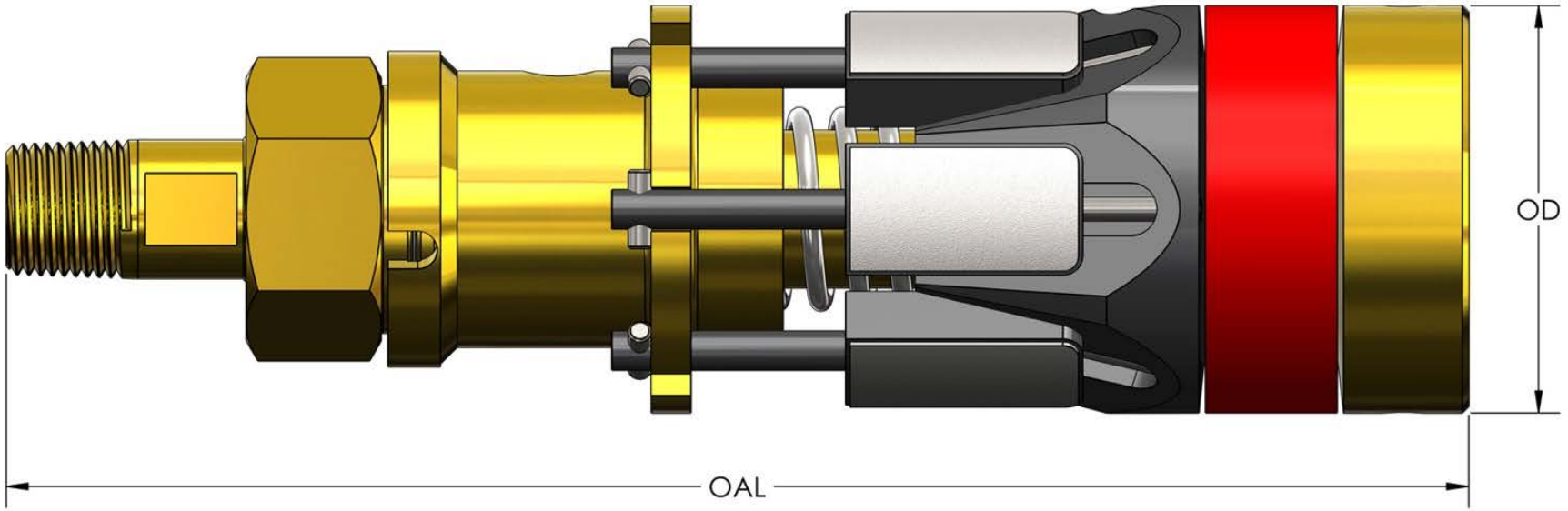

Figure 3: GripSafe ST Outboard Retraction Blocking Diagram Dimensions

Table 2: GripSafe ST ORB 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)	Back Pressure Vent Thread	Back Pressure Rating (psi)
								Norm	Max.				
3/4	40,STD,40S	GSST-I-S-0075-040	0.79	0.80 - 0.87	0.035	0.3	4.15	2.9	4.5	1/2	1/4 Open End	1/4 MNPT	10000
	80,XS,80S	GSST-I-S-0075-080	0.71	0.72 - 0.79	0.035	0.3	4.15	2.2	3.5	1/2	1/4 Open End	1/4 MNPT	10000
1	10	GSST-I-S-0100-010	1.04	1.06 - 1.16	0.055	0.4	4.13	6.3	9.7	5/8	1/4 Open End	1/16 MNPT	10000
	40,STD,40S	GSST-I-S-0100-040	0.99	1.02 - 1.11	0.055	0.4	4.13	5.6	8.7	5/8	1/4 Open End	1/16 MNPT	10000
	80,XS,80S	GSST-I-S-0100-080	0.90	0.92 - 1.02	0.055	0.4	4.13	4.5	6.9	5/8	1/4 Open End	1/16 MNPT	10000
	160	GSST-I-S-0100-160	0.78	0.79 - 0.85	0.035	0.3	4.15	2.8	4.4	1/2	1/4 Open End	1/4 MNPT	10000
1-1/4	10	GSST-I-S-0125-010	1.38	1.39 - 1.54	0.068	1.0	5.13	15	23	3/4	3/8 Open End	1/8 MNPT	10000
	40,STD,40S	GSST-I-S-0125-040	1.31	1.33 - 1.48	0.068	0.9	5.13	13	20	3/4	3/8 Open End	1/8 MNPT	10000
	80,XS,80S	GSST-I-S-0125-080	1.21	1.23 - 1.38	0.065	0.8	5.13	11	17	3/4	3/8 Open End	1/8 MNPT	10000
	160	GSST-I-S-0125-160	1.11	1.12 - 1.22	0.055	0.5	4.13	7.2	11	5/8	1/4 Open End	1/16 MNPT	10000
	XX	GSST-I-S-0125-XX	0.86	0.87 - 0.94	0.045	0.3	4.15	3.5	5.5	1/2	1/4 Open End	1/4 MNPT	10000
1-1/2	10	GSST-I-S-0150-010	1.60	1.64 - 1.80	0.085	1.5	5.94	24	37	1	7/16 Open End	1/4 MNPT	10000
	40,STD,40S	GSST-I-S-0150-040	1.53	1.56 - 1.73	0.085	1.4	5.94	21	33	1	7/16 Open End	1/4 MNPT	10000
	80,XS,80S	GSST-I-S-0150-080	1.42	1.45 - 1.62	0.085	1.2	5.94	18	28	1	7/16 Open End	1/4 MNPT	10000
	160	GSST-I-S-0150-160	1.27	1.30 - 1.44	0.068	0.9	5.13	12	19	3/4	3/8 Open End	1/8 MNPT	10000
	XX	GSST-I-S-0150-XX	1.05	1.08 - 1.16	0.055	0.4	4.13	6.3	9.8	5/8	1/4 Open End	1/16 MNPT	10000
2	10	GSST-I-S-0200-010	2.03	2.05 - 2.28	0.130	2.9	6.94	47	75	1-1/4	9/16 Open End	3/8 MNPT	10000
	40,STD,40S	GSST-I-S-0200-040	1.94	1.97 - 2.19	0.130	2.6	6.94	42	65	1-1/4	9/16 Open End	3/8 MNPT	10000
	80,XS,80S	GSST-I-S-0200-080	1.81	1.84 - 2.06	0.130	2.3	6.94	36	55	1-1/4	9/16 Open End	3/8 MNPT	10000
	160	GSST-I-S-0200-160	1.60	1.64 - 1.80	0.085	1.5	5.94	24	37	1	7/16 Open End	1/4 MNPT	10000
	XX	GSST-I-S-0200-XX	1.42	1.45 - 1.62	0.085	1.2	5.94	18	28	1	7/16 Open End	1/4 MNPT	10000
2-1/2	10	GSST-I-S-0250-010	2.51	2.57 - 2.77	0.125	4.8	7.88	85	135	1-3/8	9/16 Open End	3/8 MNPT	8000
	40,STD,40S	GSST-I-S-0250-040	2.34	2.38 - 2.61	0.125	4.2	7.88	75	115	1-3/8	9/16 Open End	3/8 MNPT	8000
	80,XS,80S	GSST-I-S-0250-080	2.20	2.24 - 2.46	0.125	3.8	7.88	65	100	1-3/8	9/16 Open End	3/8 MNPT	8000
	160	GSST-I-S-0250-160	2.00	2.06 - 2.25	0.125	2.8	6.94	46	70	1-1/4	9/16 Open End	3/8 MNPT	10000
	XX	GSST-I-S-0250-XX	1.69	1.74 - 1.89	0.085	1.6	5.94	27	42	1	7/16 Open End	1/4 MNPT	10000
3	10	GSST-I-S-0300-010	3.07	3.10 - 3.44	0.193	7.8	8.00	150	230	1-5/8	3/4 Box End	1/4 FNPT	8000
	40,STD,40S	GSST-I-S-0300-040	2.88	2.92 - 3.25	0.193	6.9	8.00	130	200	1-5/8	3/4 Box End	1/4 FNPT	8000
	80,XS,80S	GSST-I-S-0300-080	2.71	2.75 - 3.09	0.190	6.2	8.00	110	175	1-5/8	3/4 Box End	1/4 FNPT	8000
	160	GSST-I-S-0300-160	2.50	2.56 - 2.76	0.125	4.8	7.88	85	130	1-3/8	9/16 Open End	3/8 MNPT	8000
	XX	GSST-I-S-0300-XX	2.18	2.24 - 2.42	0.125	3.7	6.94	55	85	1-1/4	9/16 Open End	3/8 MNPT	8000
3-1/2	10	GSST-I-S-0350-010	3.56	3.61 - 3.96	0.204	11.5	8.88	225	350	1-3/4	7/8 Box End	3/8 FNPT	6000
	40,STD,40S	GSST-I-S-0350-040	3.34	3.39 - 3.75	0.204	10.4	8.88	195	305	1-3/4	7/8 Box End	3/8 FNPT	6000
	80,XS,80S	GSST-I-S-0350-080	3.16	3.21 - 3.56	0.208	9.3	8.88	175	270	1-3/4	7/8 Box End	3/8 FNPT	6000
	XX	GSST-I-S-0350-XX	2.60	2.66 - 2.86	0.125	5.1	7.88	95	145	1-3/8	9/16 Open End	3/8 MNPT	8000
4	120	GSST-I-S-0400-120	3.42	3.52 - 3.83	0.205	10.7	8.88	205	320	1-3/4	7/8 Box End	3/8 FNPT	6000
	160	GSST-I-S-0400-160	3.23	3.33 - 3.64	0.205	9.8	8.88	185	285	1-3/4	7/8 Box End	3/8 FNPT	6000
	XX	GSST-I-S-0400-XX	2.96	2.99 - 3.34	0.193	7.3	8.00	135	215	1-5/8	3/4 Box End	1/4 FNPT	8000

5. Preparing the GripSafe ST ORB Plug for Installation

5.1 Before use, apply 3-4 drops of mineral oil into the hole marked "OIL" on the ORB **Spring Plate (3)**. Refer to Figure 4 for guidance.

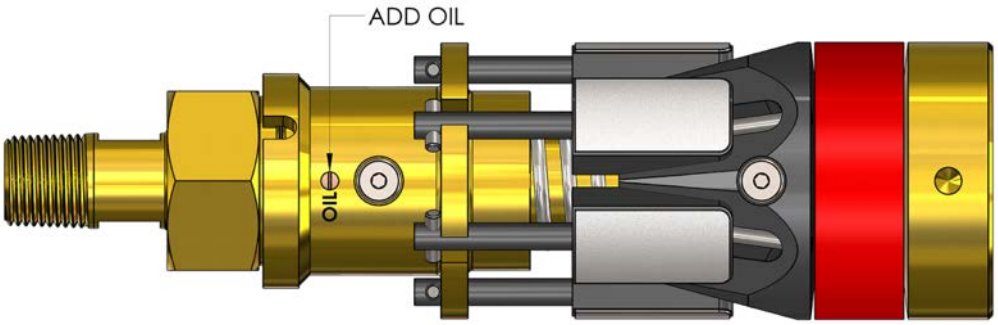

Figure 4: Adding Oil to the ORB Spring Plate's Oil Hole

- The GripSafe ST ORB plug should arrive from the factory in the Retracted position. Refer to Figure 5 for details.

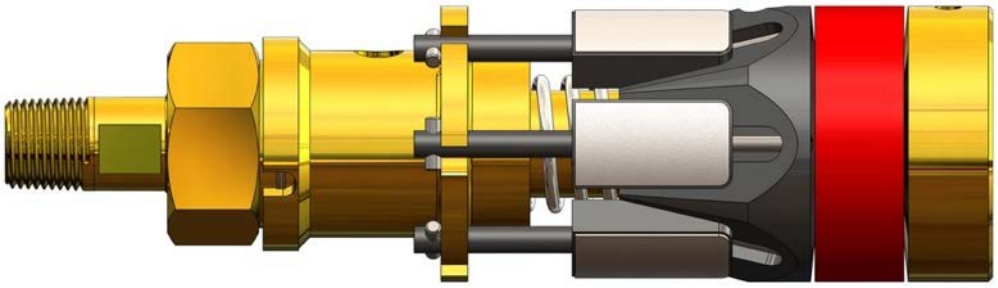

Figure 5: Not Ready to Install State (Retracted)

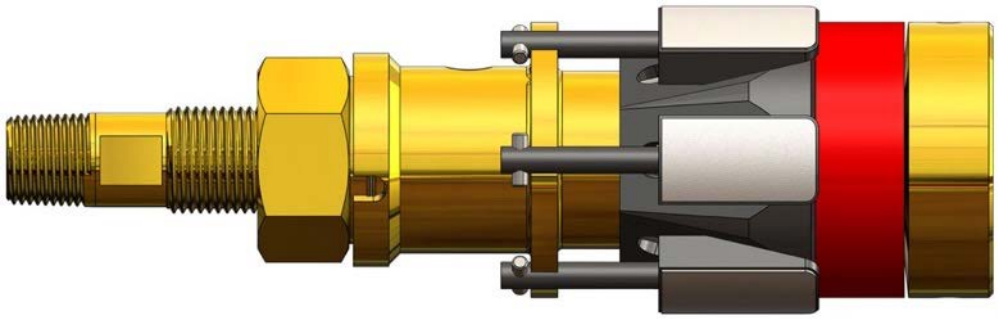

Figure 6: Ready to Install State (Compressed)

5.2 Tighten the **Compression Hex Nut (2)** until the ORB **Spring Plate (3)** is flush with the **Wedge Cone (6)**. Refer to Figure 6 for reference.

- Avoid over-torquing the **Compression Hex Nut (2)** to prevent the **Seal (9)** from expanding beyond the outer diameter (OD) of the plug.
- In the Compressed state, as shown in Figure 6, the GripSafe ST ORB plug will grip the pipe immediately upon insertion.

CHECK: Ensure the plug is clean and free of debris before each use. Each **Wedge Gripper (11)** should move freely in its slot without resistance. Any blockage from dirt or contaminants can prevent proper gripping, potentially causing the plug to eject under pressure, leading to injury, material loss, or equipment damage.

6. Installing the GripSafe ST ORB Plug

> **CAUTION:** Ensure the plug is clean before use. Each **Wedge Gripper (11)** should move freely in its slot. Blockages can prevent proper gripping, risking ejection under pressure and resulting in injury, material loss, or equipment damage.

6.1 Insert the GripSafe ST ORB plug into the pipe.

- Refer to Table 2 for clearance requirements and ensure the installation pipe's inner diameter is within the specified Internal Diameter Range.

6.2 Slowly push the plug into the pipe.

6.3 A slight rocking motion will aid in the installation.

- Once the **Wedge Grippers (11)** contact the pipe's inner diameter, they will automatically grip, making removal of the plug impossible. Refer to Section 8 for instructions on plug removal, if necessary.

6.4 Push the GripSafe ST ORB plug deeper into the pipe to reach the desired depth. The top of the **ORB Spring Plate's (3)** slotted section should not extend beyond the face of the fitting or pipe. Refer to Figure 7 for a properly installed plug and Figure 8 for an improperly installed one. If needed, the top of the ORB **Spring Plate's (3)** slotted section can be inserted further into the fitting or pipe.

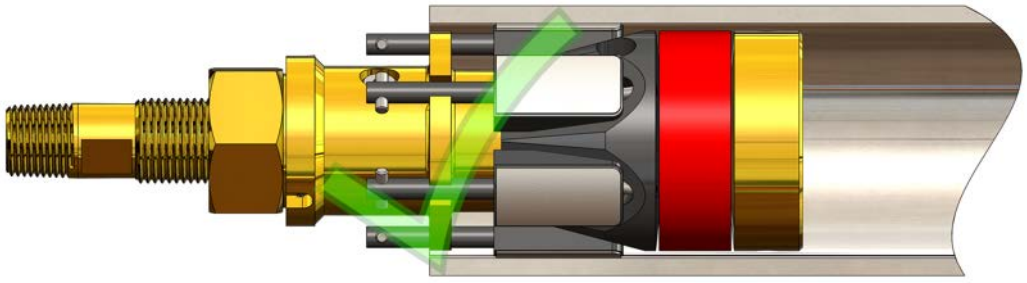

Figure 7: GripSafe ST ORB minimum insertion depth in a sectioned pipe

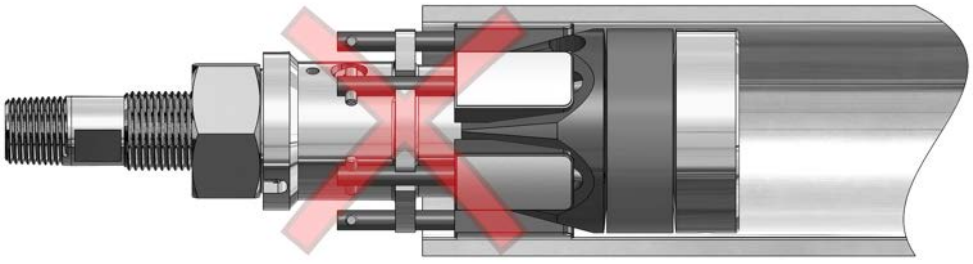

Figure 8: GripSafe ST ORB incorrect insertion depth in a sectioned pipe

6.5 Use a crow's foot attached to a torque wrench to tighten the **Compression Hex Nut (2)**, while securing the Backup Hex or flats on the **Shaft (1)** with a wrench until the Minimum Compression Torque specified in Table 2 is achieved.

TEMPERATURE NOTE: If welding is required on the pipe while the plug is installed, position the **Seal (9)** at least 6 inches from the center of any active weld to avoid melting. For post-weld heat treatments or bake-outs, the **Seal (9)** should be at least 12 inches from the nearest heating element, with the installation depth not exceeding 220°F. For high-temperature bake-outs (400°F or higher), install the plug as deeply as possible. Always monitor pressure behind the plug (ORB) and between seals (DBB), stopping work immediately if any pressure drop occurs. Additionally, monitor the pipe's external surface temperature at the seal location to prevent seal damage.

CAUTION: Using an impact wrench is not recommended, as it may damage the **Spring Plate Alignment Screw (4)** and **Wedge Cone Alignment Screw (7)** for sizes ¾" – 2", or the **Spring Plate (3)** and **Wedge Cone Alignment Key (20)** for sizes 2-1/2" and above.

CAUTION: Failing to use a backup wrench to keep the shaft stationary will place excessive stress on the **Wedge Cone Alignment Screw (7)** for sizes ¾" – 2" or the **Spring Plate (3)** and **Wedge Cone Alignment Key (20)** for sizes 2-1/2" and above. This could lead to failure, resulting in a stuck plug or causing it to eject under pressure.

6.6 Verify integrity of the ***Seal(9)***.

- If the plug is being used for pressure testing, install a hydrotest pump using appropriate fittings at the **Vent Port (16)**. Otherwise, cap the port to seal the system or use a backpressure monitoring tee.

- It may be beneficial to attach a gauge and vent hose assembly or backpressure monitoring tee to the Vent Port (16) to relieve backpressure. The hose should be long enough to direct any vapor away from workers. A valve can also be connected for safe backpressure removal during plug removal (see Section 8). When using a backpressure monitoring tee, consider placing a pressure gauge on the bull side of the tee and connecting the run side to the Vent Port (16) with a ball valve. Attaching a hose to the ball valve can further direct any vented vapor to a safe location away from personnel.

CAUTION: Rapidly flowing gases or liquids through hoses can cause hose whip. Exercise caution to prevent this, as failure to do so may result in personnel injury or equipment damage.

- Increase the pressure to 20% of the target pressure or 100 psig, whichever is lower. Visually inspect for leaks to check seal integrity. A pressure drop may not necessarily indicate a leak, as USA Industries seals can creep under pressure until fully seated, increasing the test volume. In smaller test volumes, a gradual pressure loss may be noticeable during this creep phase. To seat the seal, reapply pressure until it stabilizes. This seal creep can also occur at full pressure, and the resolution is the same in both cases.

CAUTION: Never stand directly in front of the GripSafe ST Outboard Retraction Blocking plug at any time. Always treat installed plugs this way, regardless of whether there is backpressure.

CAUTION: If backpressure develops, it is crucial to continuously monitor the pressure using an attached gauge and visually inspect the pipe's integrity to ensure the safety of personnel and equipment. Any bulging, enlargement, or tapering of the pipe indicates overpressurization. The backpressure rating listed in Table 2 reflects the GripSafe ST Outboard Retraction Blocking's pressure-holding capability, which may exceed the design limitations of the system being tested.

7. Removal of GripSafe ST ORB Plug

7.1 Depressurize the system using the hydrotest pump or the valve on the backpressure monitoring tee and drain all water.

7.2 Ensure that there is no backpressure on the GripSafe ST ORB plug.

CAUTION: SLOWLY open the **Vent Port (16)** to relieve backpressure. Exercise caution when opening valves or loosening fittings to prevent hazardous pressure flow or fittings becoming dangerous projectiles, which could cause injury or equipment damage. If using a backpressure monitoring tee, be aware that rapid gas or liquid flow can cause hose whip. Take care to avoid this, as it may also lead to injury and equipment damage.

7.3 Loosen the ***Compression Hex Nut(2)***.

- Once the **Seal (9)** is released from the pipe's internal diameter, water may flow out. Be prepared to capture it if desired. Continue to slowly loosen the **Compression Hex Nut (2)** until the wedges are fully relaxed (retracted) and the seal is freed from the pipe (see Figure 5).

7.4 Remove the GripSafe ST ORB plug from the pipe.

- Clean and store for later use or return to USA Industries.
- The texture of the **Wedge Grippers (11)** may become clogged with pipe scale and rust after several uses. Inspect this surface after each use to maintain

optimal gripping strength. Clean with mild dish soap and a stiff stainless-steel brush, like a welding brush. For persistent plugging, a household rust remover and a stiff brush should suffice. Rinse the plug thoroughly with tap water and dry completely.

- Inspect the **Wedge Grippers (11)** for freedom of motion. Each should slide freely up and down in its slot without resistance.
- Store in a location away from direct sunlight and temperatures above 150°F, as UV light and excessive heat can degrade the **Seal (9)** over time.

8. Installing and Using Safety Gag

NOTE: Safety gags are not mandatory but are recommended for added protection against the unlikely event of plug discharge.

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

8.2 Follow the plug installation instructions in Sections 5-6 to install the GripSafe ST ORB before proceeding to step 8.4.

8.3 Place the pear-shaped link over the **Back Pressure Vent Port (16)**.

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

8.5 Begin with the two bolts closest to the pipe and snug all the bolts on the clamp. For the two bolts nearest the pipe, turn an additional 1/3 to 1/2 turn.

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

8.6 Reverse steps 8.1-8.5 to uninstall.

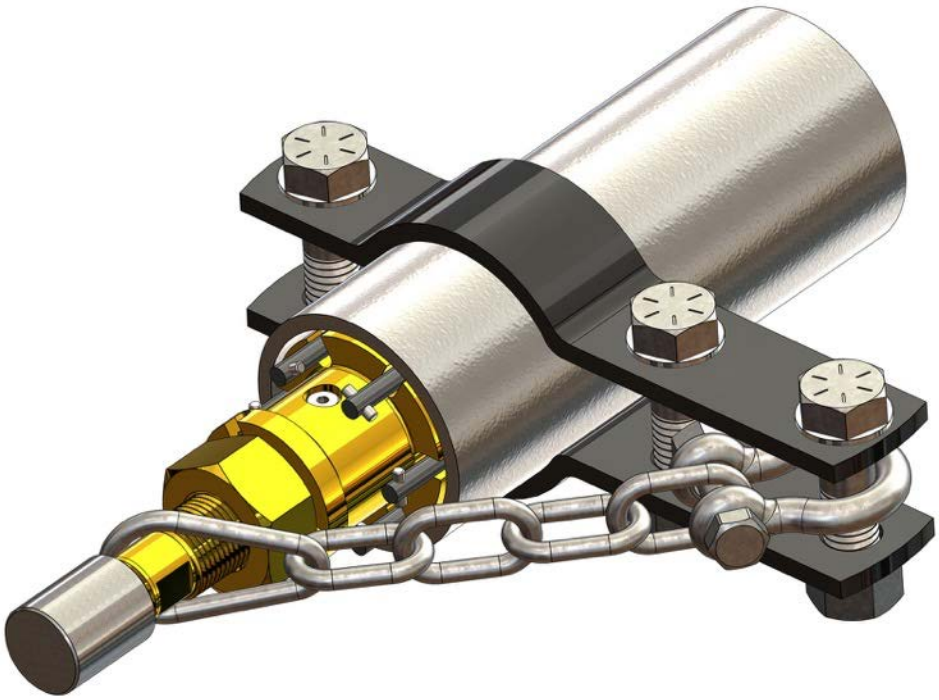

Figure 9: Properly Installed Safety Gag on Pipe

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