USA® INDUSTRIES
SINCE 1982

GRIPSAFE® ST

OPERATING MANUAL

4” * - 12”

14” - 24”

Large Double Block and Bleed (DBB) Plug

4”* - 24”**

*For all Schedules other than 120, 160 and XXH. Those Schedules use the Small Double Block & Bleed Plug Size ** Larger Sizes Available Upon Request.

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

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S. Houston, TX • Prairieville, LA

1. Introduction

USA Industries thanks you for choosing GripSafe ST pipe plugging technology. This manual covers the proper use of this technology to ensure safe operating conditions.

WARNING: Do not use GripSafe ST equipment before fully reading and comprehending this manual. Failure to follow this manual in full may result in injury to personnel and damage to equipment.

All necessary sockets, wrenches and lifting device to install this equipment are available for rental or purchase from USA Industries See **Section 4**, Table 2 for sockets and **Section 8**, Table 3 for lifting device.

The information in this manual is for the use of a GripSafe ST 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.

2. Safety

- Failing to adhere to safety requirements may cause the GripSafe ST plug to fail, potentially resulting in personal injury, material loss, and damage to equipment.
- Always wear appropriate Personal Protective Equipment (PPE) when handling the GripSafe ST plug, as specified by site safety regulations. Follow site procedures for the safe lifting and operation of equipment.
- Never install the GripSafe ST plug in a position where the Gripping Wedge will be located over weld droop or ridge.
- Never install the Seals or Gripping Wedges over a section of pipe that is missing its interior wall, i.e. weldolet, tee, etc.
- Handle the Wedge Studs with care. Never strike, hammer, or pry them, and do not remove the nut on the Wedge Studs.
- Pressure testing is hazardous; safety precautions are crucial. Always avoid standing or passing in front of a test plug during installation, testing, and removal.
- Do not adjust 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; never apply pressure on the non-rated side of the plug.
- The maximum back pressure rating indicates the plug's ultimate holding capacity. Do not exceed the weakest component's pressure capacity in a pressurized system. Before testing, review your system's components to ensure the maximum test pressure with the GripSafe ST plug complies with Table 3 and all relevant industry and site-specific standards.
- We recommend using water as the test medium. Ensure all gases are vented from the vessel before pressurizing the system.
- When conducting pneumatic testing, it's crucial to minimize potential risks to personnel and equipment. USA Industries recommends using Nitrogen as the testing medium since it is non-combustible. Please adhere to the guidelines outlined in ASME PCC-2 for the repair of pressure equipment and piping during pneumatic testing.
- Refer to Table 3 for Maximum Allowable Pressures and DO NOT EXCEED the specified ratings when pressurizing the system. During a hydro test, monitor the pipe's exterior where the Wedge Grippers contact. If you notice any deformation or swelling, stop immediately and gradually release the pressure. Contact USA Industries for assistance.
- If you hear popping or clicking sounds during a hydro test, stop immediately and slowly release the pressure. These noises may indicate the Wedge Gripper is slipping, cracking, or a plug component is failing. Remove the plug from the pipe or fitting and inspect it for damage. For further assistance, contact USA Industries.
- Ensure the plug is free of debris and contaminants. Each Wedge Gripper should move freely in its slot without resistance. Impeded movement can prevent a secure grip on the pipe's ID, risking plug ejection under pressure and potentially leading to injury, material loss, or damage.
- For any questions or concerns, contact USA Industries for technical assistance

3. Parts

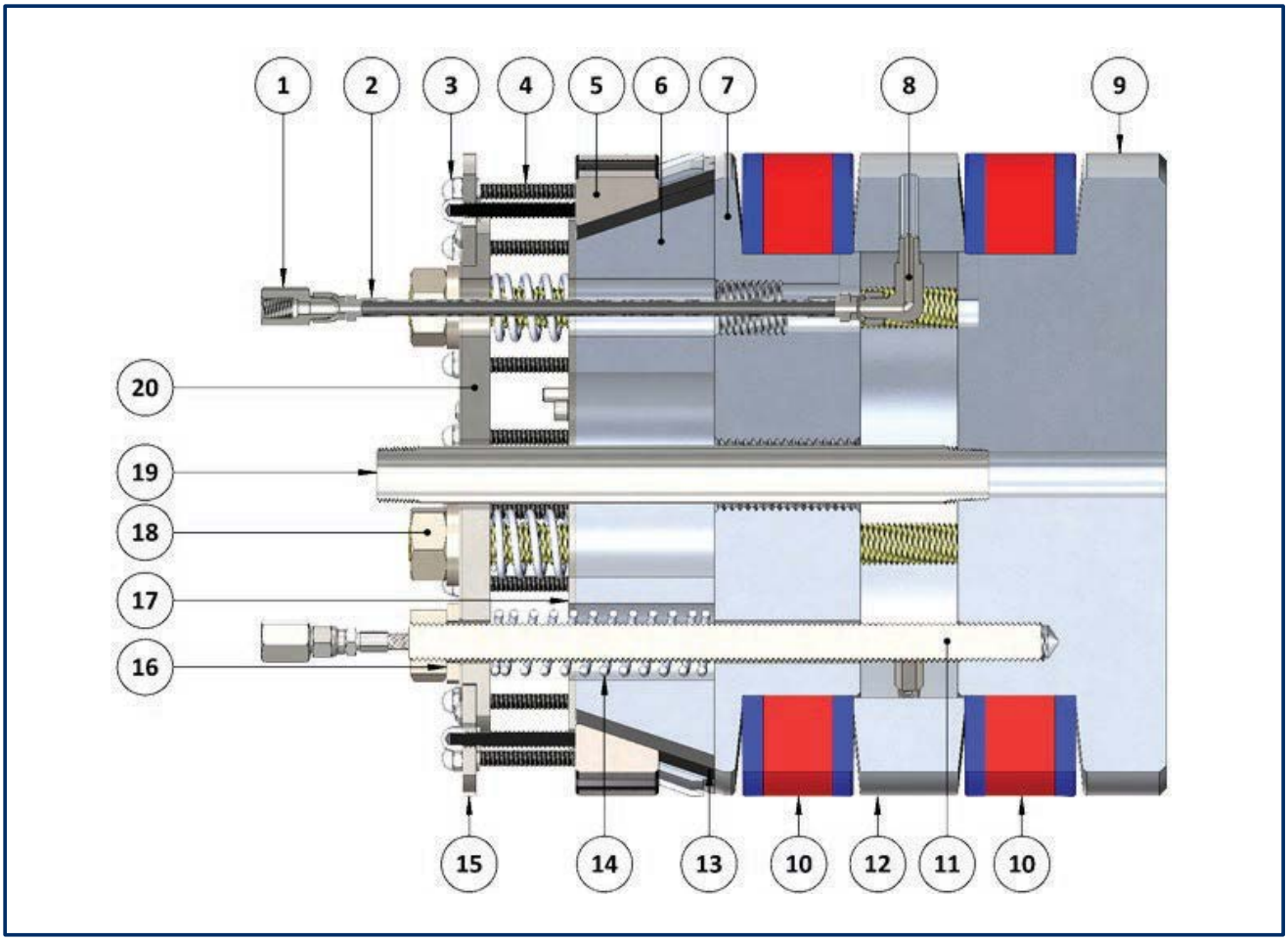


Figure 1: GripSafe ST DBB Diagram

TABLE 1: GRIPSAFE ST BILL OF MATERIALS

Nominal Pipe Size (in)	Schedule	① MJIC-FNPT Adapter	② Vent Hose	③ Wedge Gripper Nut	④ Wedge Gripper Stem	⑤ Wedge Gripper	⑥ Wedge Cone	⑦ Top Compression Plate	⑧ MNPT-MJIC Elbow Fitting	⑨ Bottom Compression Plate	⑩ Seal	⑪ All-Thread Shaft	⑫ Middle Plate	⑬ Back Plate	⑭ Retraction Compression Spring	⑮ Spring Plate Halo	⑯ Compression Washer Assembly	⑰ Retainer Plate	⑱ Compression Hex Nut	⑲ Back Pressure Vent Port	⑳ Spring Plate Hub
6	10S-80S	2	2	9	9	9	1	1	2	1	2	4	1	9	1	0	8	1	4	1	1
	120	2	2	8	8	8	1	1	2	1	2	4	1	8	1	0	8	1	4	1	1
	160	2	2	7	7	7	1	1	2	1	2	4	1	7	1	0	8	1	4	1	1
	XXH	2	2	6	6	6	1	1	2	1	2	4	1	6	1	0	8	1	4	1	1
8	10S-80S	2	2	15	15	15	1	1	2	1	2	4	1	15	1	0	8	1	4	1	1
	100	2	2	14	14	14	1	1	2	1	2	4	1	14	1	0	8	1	4	1	1
	120-140	2	2	13	13	13	1	1	2	1	2	4	1	13	1	0	8	1	4	1	1
	160-XXH	2	2	12	12	12	1	1	2	1	2	4	1	12	1	0	8	1	4	1	1
10	10S-100	2	2	20	20	20	1	1	2	1	2	4	1	20	4	1	8	1	4	1	1
	120	2	2	19	19	19	1	1	2	1	2	4	1	19	1	0	8	1	4	1	1
	140,XXH	2	2	18	18	18	1	1	2	1	2	4	1	18	1	0	8	1	4	1	1
	160	2	2	17	17	17	1	1	2	1	2	4	1	17	1	0	8	1	4	1	1
12	10S-80S	2	2	24	24	24	1	1	2	1	2	4	1	24	4	1	8	1	4	1	1
	60-80	2	2	25	25	25	1	1	2	1	2	4	1	25	4	1	8	1	4	1	1
	100	2	2	24	24	24	1	1	2	1	2	4	1	24	4	1	8	1	4	1	1
	120,XXH	2	2	23	23	23	1	1	2	1	2	4	1	23	4	1	8	1	4	1	1
	140	2	2	22	22	22	1	1	2	1	2	4	1	22	4	1	8	1	4	1	1
	160	2	2	21	21	21	1	1	2	1	2	4	1	21	4	1	8	1	4	1	1
14	10S-80S	2	2	24	24	24	1	1	2	1	2	6	1	24	6	1	12	1	6	1	1
	60-100	2	2	27	27	27	1	1	2	1	2	6	1	27	6	1	12	1	6	1	1
	120	2	2	26	26	26	1	1	2	1	2	6	1	26	6	1	12	1	6	1	1
	140	2	2	25	25	25	1	1	2	1	2	6	1	25	6	1	12	1	6	1	1
	160	2	2	24	24	24	1	1	2	1	2	6	1	24	6	1	12	1	6	1	1
16	10S-80	2	2	32	32	32	1	1	2	1	2	6	1	32	6	1	12	1	6	1	1
	100	2	2	31	31	31	1	1	2	1	2	6	1	31	6	1	12	1	6	1	1
	120	2	2	30	30	30	1	1	2	1	2	6	1	30	6	1	12	1	6	1	1
	140	2	2	29	29	29	1	1	2	1	2	6	1	29	6	1	12	1	6	1	1
	160	2	2	28	28	28	1	1	2	1	2	6	1	28	6	1	12	1	6	1	1
18	10S-80S	2	2	36	36	36	1	1	2	1	2	6	1	36	6	1	12	1	6	1	1
	40-60	2	2	38	38	38	1	1	2	1	2	6	1	38	6	1	12	1	6	1	1
	80	2	2	37	37	37	1	1	2	1	2	6	1	37	6	1	12	1	6	1	1
	100	2	2	36	36	36	1	1	2	1	2	6	1	36	6	1	12	1	6	1	1
	120	2	2	35	35	35	1	1	2	1	2	6	1	35	6	1	12	1	6	1	1
	140	2	2	34	34	34	1	1	2	1	2	6	1	34	6	1	12	1	6	1	1
	160	2	2	33	33	33	1	1	2	1	2	6	1	33	6	1	12	1	6	1	1

TABLE 1: GRIPSAFE ST BILL OF MATERIALS

Nominal Pipe Size (in)	Schedule	① MJIC-FNPT Adapter	② Vent Hose	③ Wedge Gripper Nut	④ Wedge Gripper Stem	⑤ Wedge Gripper	⑥ Wedge Cone	⑦ Top Compression Plate	⑧ MNPT-MJIC Elbow Fitting	⑨ Bottom Compression Plate	⑩ Seal	⑪ All-Thread Shaft	⑫ Middle Plate	⑬ Back Plate	⑭ Retraction Compression Spring	⑮ Spring Plate Halo	⑯ Compression Washer	⑰ Retainer Plate	⑱ Compression Hex Nut	⑲ Back Pressure Vent Port	⑳ Spring Plate Hub
20	10S-80S	2	2	40	40	40	1	1	2	1	2	8	1	40	8	1	16	1	8	1	1
	40	2	2	44	44	44	1	1	2	1	2	8	1	44	8	1	16	1	8	1	1
	60	2	2	43	43	43	1	1	2	1	2	8	1	43	8	1	16	1	8	1	1
	80	2	2	42	42	42	1	1	2	1	2	8	1	42	8	1	16	1	8	1	1
	100	2	2	41	41	41	1	1	2	1	2	8	1	41	8	1	16	1	8	1	1
	120	2	2	40	40	40	1	1	2	1	2	8	1	40	8	1	16	1	8	1	1
	140	2	2	38	38	38	1	1	2	1	2	8	1	38	8	1	16	1	8	1	1
	160	2	2	37	37	37	1	1	2	1	2	8	1	37	8	1	16	1	8	1	1
24	10S-80S	2	2	48	48	48	1	1	2	1	2	8	1	48	8	1	16	1	8	1	1
	30	2	2	55	55	55	1	1	2	1	2	8	1	55	8	1	16	1	8	1	1
	40	2	2	54	54	54	1	1	2	1	2	8	1	54	8	1	16	1	8	1	1
	60	2	2	53	53	53	1	1	2	1	2	8	1	53	8	1	16	1	8	1	1
	80	2	2	52	52	52	1	1	2	1	2	8	1	52	8	1	16	1	8	1	1
	100	2	2	50	50	50	1	1	2	1	2	8	1	50	8	1	16	1	8	1	1
	120	2	2	48	48	48	1	1	2	1	2	8	1	48	8	1	16	1	8	1	1
	140	2	2	47	47	47	1	1	2	1	2	8	1	47	8	1	16	1	8	1	1
	160	2	2	46	46	46	1	1	2	1	2	8	1	46	8	1	16	1	8	1	1

4. Specifications

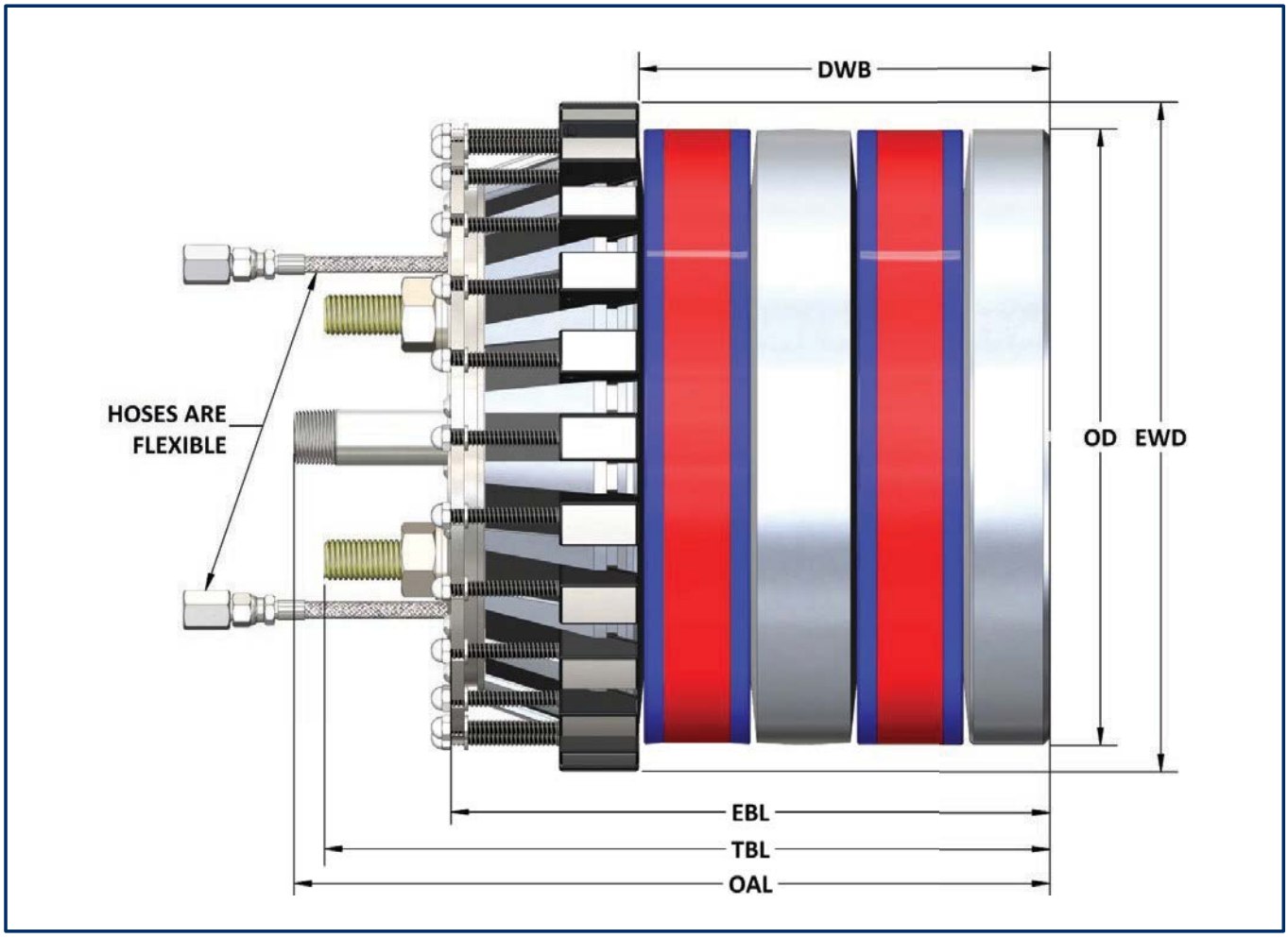


Figure 2: GripSafe ST DBB Dimensions Diagram

THE INFORMATION BELOW APPLIES TO ALL SPECIFICATION PAGES THAT FOLLOW THIS PAGE:

* Larger sizes and custom configurations are available upon request. • NPS 6-24 TOOL OD MUST BE WITHIN 1/8” CONCENTRICITY TO THE PIPE ID.

(P-XXXX) - When testing in ANSI A106 Grade B pipe material, a Pipe Reinforcement Device (PRD) is required if the test pressure will exceed the number identified after the “P-”. If the material is not A106 B, consult USA Industries engineering team for more information. In general, a PRD is strongly recommended for all pipes 10/10S and thinner walled.

• NEVER EXCEED THE MAXIMUM RATED PRESSURE OF THE LOWEST RATED COMPONENT IN THE SYSTEM.

• **DATA IS SUBJECT TO CHANGE**. Consult manufacturer to verify that this document is the latest release

TABLE 2: GRIPSAFE ST 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)		Comp. Hex Nut Socket Size (in)	Fill & Vent Port Thread	Back Pressure Vent Thread	MAX Plug Back Pressure Rating (PSI)	Between the Seal Test Pressure (PSI)
								Norm	Max.					
6	10,10S	GS-D-S-0600-010	5.98	6.044 - 6.422	0.375	32	11.25	85	130	1-1/16”	1/4” FNPT	1/4” MNPT	3300	2500
	40,STD,40S	GS-D-S-0600-040	5.69	5.752 - 6.129	0.375	31	11.25	75	110	1-1/16”	1/4” FNPT	1/4” MNPT	3600	2500
	80,XS,80S	GS-D-S-0600-080	5.39	5.448 - 5.823	0.375	28	11.25	60	95	1-1/16”	1/4” FNPT	1/4” MNPT	4000	2500
	120	GS-D-S-0600-120	5.13	5.188 - 5.562	0.375	26	11.25	55	80	1-1/16”	1/4” FNPT	1/4” MNPT	3900	2500
	160	GS-D-S-0600-160	4.81	4.874 - 5.246	0.375	24	11.25	50	75	3/4”	1/4” FNPT	1/4” MNPT	3850	2500
	XXH	GS-D-S-0600-XXH	4.52	4.584 - 4.955	0.375	22	11.25	50	75	3/4”	1/4” FNPT	1/4” MNPT	3700	2500
8	10,10S	GS-D-S-0800-010	7.95	8.016 - 8.404	0.375	58	13.22	190	270	1-1/4”	1/4” FNPT	1/2” MNPT	3200	2500
	20	GS-D-S-0800-020	7.75	7.812 - 8.199	0.375	58	13.22	175	265	1-1/4”	1/4” FNPT	1/2” MNPT	3350	2500
	30	GS-D-S-0800-030	7.70	7.758 - 8.145	0.375	56	13.22	170	260	1-1/4”	1/4” FNPT	1/2” MNPT	3400	2500
	40,STD,40S	GS-D-S-0800-040	7.61	7.668 - 8.054	0.375	54	13.22	165	250	1-1/4”	1/4” FNPT	1/2” MNPT	3475	2500
	60	GS-D-S-0800-060	7.44	7.500 - 7.885	0.375	52	13.22	155	235	1-1/4”	1/4” FNPT	1/2” MNPT	3625	2500
	80,XS,80S	GS-D-S-0800-080	7.25	7.312 - 7.696	0.375	50	13.22	140	215	1-1/4”	1/4” FNPT	1/2” MNPT	3800	2500
	100	GS-D-S-0800-100	7.06	7.124 - 7.507	0.375	45	13.22	105	160	1-1/4”	1/4” FNPT	1/2” MNPT	3725	2500
	120	GS-D-S-0800-120	6.81	6.874 - 7.256	0.375	43	13.22	100	155	1-1/4”	1/4” FNPT	1/2” MNPT	3725	2500
	140	GS-D-S-0800-140	6.63	6.688 - 7.069	0.375	42	13.22	95	150	1-1/16”	1/4” FNPT	1/4” MNPT	3925	2500
	160	GS-D-S-0800-160	6.44	6.500 - 6.880	0.375	40	13.22	95	145	1-1/16”	1/4” FNPT	1/4” MNPT	3825	2500
	XXH	GS-D-S-0800-XXH	6.50	6.562 - 6.943	0.375	40	13.22	95	145	1-1/16”	1/4” FNPT	1/4” MNPT	3750	2500
10	10,10S	GS-D-S-1000-010	10.05	10.107 - 10.505	0.375	88	13.20	235	270	1-1/4”	1/4” FNPT	3/4” MNPT	2725	2500
	20	GS-D-S-1000-020	9.88	9.937 - 10.335	0.375	88	13.20	235	270	1-1/4”	1/4” FNPT	3/4” MNPT	2800	2500
	30	GS-D-S-1000-030	9.76	9.823 - 10.220	0.375	86	13.20	225	270	1-1/4”	1/4” FNPT	3/4” MNPT	2875	2500
	40,STD,40S	GS-D-S-1000-040	9.65	9.707 - 10.103	0.375	86	13.20	215	270	1-1/4”	1/4” FNPT	3/4” MNPT	2950	2500
	60,XS,80S	GS-D-S-1000-08S	9.38	9.437 - 9.832	0.375	78	13.20	195	270	1-1/4”	1/4” FNPT	3/4” MNPT	3100	2500
	80	GS-D-S-1000-080	9.19	9.249 - 9.643	0.375	76	13.20	140	215	1-1/4”	1/4” FNPT	3/4” MNPT	3225	2500
	100	GS-D-S-1000-100	8.94	8.999 - 9.392	0.375	76	13.20	135	210	1-1/4”	1/4” FNPT	3/4” MNPT	3400	2500
	120	GS-D-S-1000-120	8.69	8.749 - 9.141	0.375	74	13.20	135	205	1-1/4”	1/4” FNPT	1/2” MNPT	3425	2500
	140,XXH	GS-D-S-1000-140	8.38	8.437 - 8.827	0.375	72	13.20	130	195	1-1/4”	1/4” FNPT	1/2” MNPT	3475	2500
	160	GS-D-S-1000-160	8.13	8.187 - 8.576	0.375	70	13.20	125	190	1-1/4”	1/4” FNPT	1/2” MNPT	3475	2500
12	10,10S	GS-D-S-1200-010	12.02	12.077 - 12.485	0.375	116	13.20	200	270	1-1/4”	1/4” FNPT	3/4” MNPT	2300	2500
	20	GS-D-S-1200-020	11.88	11.937 - 12.345	0.375	118	13.20	200	270	1-1/4”	1/4” FNPT	3/4” MNPT	2375	2500
	30	GS-D-S-1200-030	11.72	11.777 - 12.184	0.375	118	13.20	200	270	1-1/4”	1/4” FNPT	3/4” MNPT	2425	2500
	STD,40S	GS-D-S-1200-04S	11.63	11.687 - 12.093	0.375	122	13.20	200	270	1-1/4”	1/4” FNPT	3/4” MNPT	2475	2500
	40	GS-D-S-1200-040	11.56	11.625 - 12.031	0.375	122	13.20	200	270	1-1/4”	1/4” FNPT	3/4” MNPT	2500	2500
	XS,80S	GS-D-S-1200-08S	11.38	11.437 - 11.842	0.375	124	13.20	200	270	1-1/4”	1/4” FNPT	3/4” MNPT	2575	2500
	60	GS-D-S-1200-060	11.25	11.313 - 11.717	0.375	128	13.20	175	270	1-1/4”	1/4” FNPT	3/4” MNPT	2725	2500
	80	GS-D-S-1200-080	11.00	11.061 - 11.464	0.375	128	13.20	175	265	1-1/4”	1/4” FNPT	3/4” MNPT	2850	2500
	100	GS-D-S-1200-100	10.69	10.749 - 11.151	0.375	132	13.20	170	255	1-1/4”	1/4” FNPT	3/4” MNPT	2900	2500
	120,XXH	GS-D-S-1200-120	10.38	10.437 - 10.837	0.375	132	13.20	160	250	1-1/4”	1/4” FNPT	3/4” MNPT	2950	2500
	140	GS-D-S-1200-140	10.13	10.187 - 10.586	0.375	134	13.20	160	240	1-1/4”	1/4” FNPT	3/4” MNPT	2950	2500
	160	GS-D-S-1200-160	9.75	9.813 - 10.210	0.375	134	13.20	150	230	1-1/4”	1/4” FNPT	3/4” MNPT	3025	2500
14	10S	GS-D-S-1400-01S	13.25	13.311 - 13.725	0.375	155	15.12	270	413	1-5/8”	1/4” FNPT	1” MNPT	1925	2500
	10	GS-D-S-1400-010	13.13	13.187 - 13.601	0.375	152	15.12	265	405	1-5/8”	1/4” FNPT	1” MNPT	1950	2500
	20	GS-D-S-1400-020	13.00	13.063 - 13.476	0.375	152	15.12	250	380	1-5/8”	1/4” FNPT	1” MNPT	1975	2500
	30,STD,40S	GS-D-S-1400-04S	12.88	12.937 - 13.333	0.375	147	15.12	235	360	1-5/8”	1/4” FNPT	1” MNPT	2025	2500
	40	GS-D-S-1400-040	12.75	12.811 - 13.223	0.375	147	15.12	220	335	1-5/8”	1/4” FNPT	1” MNPT	2050	2500
	XS,80S	GS-D-S-1400-08S	12.63	12.687 - 13.098	0.375	144	15.12	205	315	1-5/8”	1/4” FNPT	1” MNPT	2100	2500
	60	GS-D-S-1400-060	12.44	12.499 - 12.909	0.375	144	15.12	210	325	1-5/8”	1/4” FNPT	1” MNPT	2425	2500
	80	GS-D-S-1400-080	12.13	12.187 - 12.596	0.375	140	15.12	205	315	1-5/8”	1/4” FNPT	1” MNPT	2550	2500
	100	GS-D-S-1400-100	11.75	11.811 - 12.218	0.375	140	15.12	200	305	1-5/8”	1/4” FNPT	1” MNPT	2725	2500
	120	GS-D-S-1400-120	11.44	11.499 - 11.904	0.375	140	15.12	195	295	1-5/8”	1/4” FNPT	1” MNPT	2750	2500
	140	GS-D-S-1400-140	11.13	11.187 - 11.591	0.375	135	15.12	185	285	1-5/8”	1/4” FNPT	1” MNPT	2800	2500
	160	GS-D-S-1400-160	10.81	10.875 - 11.277	0.375	135	15.12	180	275	1-5/8”	1/4” FNPT	1” MNPT	2825	2500

TABLE 2: GRIPSAFE ST 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)		Comp. Hex Nut Socket Size (in)	Fill & Vent Port Thread	Back Pressure Vent Thread	MAX Plug Back Pressure Rating (PSI)	Between the Seal Test Pressure (PSI)
								Norm	Max.					
16	10S	GS-D-S-1600-01S	15.25	15.311 - 15.735	0.375	212	15.12	265	420	1-5/8"	1/4" FNPT	1" MNPT	1950	2500
	10	GS-D-S-1600-010	15.13	15.187 - 15.611	0.375	210	15.12	255	395	1-5/8"	1/4" FNPT	1" MNPT	1975	2500
	20	GS-D-S-1600-020	15.00	15.063 - 15.486	0.375	206	15.12	245	370	1-5/8"	1/4" FNPT	1" MNPT	2000	2500
	30,STD,40S	GS-D-S-1600-04S	14.88	14.937 - 15.360	0.375	199	15.12	230	350	1-5/8"	1/4" FNPT	1" MNPT	2025	2500
	40,XS,80S	GS-D-S-1600-08S	14.63	14.687 - 15.108	0.375	192	15.12	200	305	1-5/8"	1/4" FNPT	1" MNPT	2100	2500
	60	GS-D-S-1600-060	14.31	14.375 - 14.795	0.375	192	15.12	205	315	1-5/8"	1/4" FNPT	1" MNPT	2200	2500
	80	GS-D-S-1600-080	14.00	14.063 - 14.481	0.375	188	15.12	200	305	1-5/8"	1/4" FNPT	1" MNPT	2300	2500
	100	GS-D-S-1600-100	13.56	13.625 - 14.041	0.375	188	15.12	195	295	1-5/8"	1/4" FNPT	1" MNPT	2350	2500
	120	GS-D-S-1600-120	13.19	13.249 - 13.663	0.375	182	15.12	185	285	1-5/8"	1/4" FNPT	1" MNPT	2400	2500
	140	GS-D-S-1600-140	12.75	12.811 - 13.223	0.375	182	15.12	180	275	1-5/8"	1/4" FNPT	1" MNPT	2500	2500
	160	GS-D-S-1600-160	12.44	12.499 - 12.909	0.375	178	15.12	175	270	1-5/8"	1/4" FNPT	1" MNPT	2525	2500
18	10S	GS-D-S-1800-01S	17.25	17.311 - 17.745	0.375	270	15.12	395	605	1-5/8"	1/4" FNPT	1" MNPT	1725	2500
	10	GS-D-S-1800-010	17.13	17.187 - 17.621	0.375	265	15.12	380	580	1-5/8"	1/4" FNPT	1" MNPT	1750	2500
	20	GS-D-S-1800-020	17.00	17.063 - 17.496	0.375	260	15.12	365	555	1-5/8"	1/4" FNPT	1" MNPT	1775	2500
	STD,40S	GS-D-S-1800-04S	16.88	16.937 - 17.370	0.375	254	15.12	345	530	1-5/8"	1/4" FNPT	1" MNPT	1800	2500
	30	GS-D-S-1800-030	16.75	16.811 - 17.243	0.375	250	15.12	330	505	1-5/8"	1/4" FNPT	1" MNPT	1825	2500
	XS,80S	GS-D-S-1800-08S	16.63	16.687 - 17.118	0.375	247	15.12	315	480	1-5/8"	1/4" FNPT	1" MNPT	1850	2500
	40	GS-D-S-1800-040	16.50	16.563 - 16.994	0.375	245	15.12	295	450	1-5/8"	1/4" FNPT	1" MNPT	1975	2500
	60	GS-D-S-1800-060	16.25	16.311 - 16.740	0.375	240	15.12	290	440	1-5/8"	1/4" FNPT	1" MNPT	2025	2500
	80	GS-D-S-1800-080	15.75	15.811 - 16.238	0.375	235	15.12	280	425	1-5/8"	1/4" FNPT	1" MNPT	2100	2500
	100	GS-D-S-1800-100	15.31	15.375 - 15.800	0.375	230	15.12	270	415	1-5/8"	1/4" FNPT	1" MNPT	2175	2500
	120	GS-D-S-1800-120	15.08	15.137 - 15.561	0.375	225	15.12	265	405	1-5/8"	1/4" FNPT	1" MNPT	2175	2500
	140	GS-D-S-1800-140	14.50	14.563 - 14.984	0.375	224	15.12	255	390	1-5/8"	1/4" FNPT	1" MNPT	2275	2500
	160	GS-D-S-1800-160	14.06	14.125 - 14.543	0.375	219	15.12	245	375	1-5/8"	1/4" FNPT	1" MNPT	2350	2500
20	10S	GS-D-S-2000-01S	19.19	19.249 - 19.693	0.375	330	15.32	325	510	1-5/8"	1/4" FNPT	1-1/2" MNPT	1550	2500
	10	GS-D-S-2000-010	19.13	19.187 - 19.631	0.375	324	15.32	320	495	1-5/8"	1/4" FNPT	1-1/2" MNPT	1550	2500
	20,STD,40S	GS-D-S-2000-04S	18.88	18.937 - 19.380	0.375	317	15.32	295	450	1-5/8"	1/4" FNPT	1-1/2" MNPT	1600	2500
	30,XS,80S	GS-D-S-2000-08S	18.63	18.687 - 19.128	0.375	308	15.32	270	410	1-5/8"	1/4" FNPT	1-1/2" MNPT	1650	2500
	40	GS-D-S-2000-040	18.44	18.499 - 18.939	0.375	298	15.32	250	380	1-5/8"	1/4" FNPT	1-1/2" MNPT	1850	2500
	60	GS-D-S-2000-060	18.00	18.063 - 18.501	0.375	292	15.32	240	370	1-5/8"	1/4" FNPT	1-1/2" MNPT	1875	2500
	80	GS-D-S-2000-080	17.56	17.625 - 18.061	0.375	285	15.32	235	360	1-5/8"	1/4" FNPT	1-1/2" MNPT	1925	2500
	100	GS-D-S-2000-100	17.06	17.125 - 17.558	0.375	278	15.32	230	350	1-5/8"	1/4" FNPT	1-1/2" MNPT	2000	2500
	120	GS-D-S-2000-120	16.63	16.687 - 17.118	0.375	281	15.32	220	340	1-5/8"	1/4" FNPT	1-1/2" MNPT	2050	2500
	140	GS-D-S-2000-140	16.12	16.183 - 16.612	0.375	270	15.32	215	330	1-5/8"	1/4" FNPT	1-1/2" MNPT	2075	2500
	160	GS-D-S-2000-160	15.69	15.751 - 16.178	0.375	259	15.32	210	320	1-5/8"	1/4" FNPT	1-1/2" MNPT	2125	2500
24	10,10S	GS-D-S-2400-010	23.13	23.187 - 23.651	0.375	431	15.32	395	600	1-5/8"	1/4" FNPT	1-1/2" MNPT	1300	2500
	20,STD,40S	GS-D-S-2400-04S	22.88	22.937 - 23.400	0.375	422	15.32	360	555	1-5/8"	1/4" FNPT	1-1/2" MNPT	1325	2500
	XS,80S	GS-D-S-2400-08S	22.63	22.687 - 23.148	0.375	414	15.32	330	505	1-5/8"	1/4" FNPT	1-1/2" MNPT	1350	2500
	30	GS-D-S-2400-030	22.50	22.563 - 23.024	0.375	409	15.32	320	490	1-5/8"	1/4" FNPT	1-1/2" MNPT	1550	2500
	40	GS-D-S-2400-040	22.25	22.311 - 22.770	0.375	400	15.32	315	485	1-5/8"	1/4" FNPT	1-1/2" MNPT	1575	2500
	60	GS-D-S-2400-060	21.69	21.749 - 22.206	0.375	382	15.32	310	470	1-5/8"	1/4" FNPT	1-1/2" MNPT	1625	2500
	80	GS-D-S-2400-080	21.19	21.249 - 21.703	0.375	388	15.32	300	460	1-5/8"	1/4" FNPT	1-1/2" MNPT	1650	2500
	100	GS-D-S-2400-100	20.56	20.625 - 21.076	0.375	374	15.32	290	445	1-5/8"	1/4" FNPT	1-1/2" MNPT	1700	2500
	120	GS-D-S-2400-120	20.00	20.063 - 20.511	0.375	372	15.32	285	435	1-5/8"	1/4" FNPT	1-1/2" MNPT	1725	2500
	140	GS-D-S-2400-140	19.50	19.563 - 20.009	0.375	366	15.32	275	420	1-5/8"	1/4" FNPT	1-1/2" MNPT	1750	2500
	160	GS-D-S-2400-160	18.94	18.999 - 19.442	0.375	360	15.32	265	410	1-5/8"	1/4" FNPT	1-1/2" MNPT	1825	2500

Table 3: Maximum Allowable Pressures (MAP)

Use the table below to determine the maximum allowable pressure (MAP) the plug and pipe can be subjected to without yielding the pipe. The yield strengths listed in the table correspond to typical minimum yield strengths of standard pipes. If using a Material Test Report (MTR) to determine the yield strength of the pipe or if the pipe yield strength exceeds the highest in the table, the precise MAP can be determined by linear interpolation.

Do not exceed MAX PLUG BACK PRESSURE RATINGS.

NPS Nominal Pipe Size	PIPE SCHEDULE	MAX PLUG BACK PRESSURE RATING (PSI) (NOT TO EXCEED)	MAXIMUM ALLOWABLE PRESSURE FOR GripSafe ST PLUGS IN PIPE BASED ON PIPE YIELD STRENGTH - SELECT THE COLUMN BELOW THAT IS LESS THAN OR EQUAL TO PIPE YIELD STRENGTH (PSI) -										
			30000 PSI (A106 A)	35000 PSI (A106 B)	40000 PSI (A106 C)	46000 PSI (X46)	52000 PSI (X52)	60000 PSI (X60)	70000 PSI (X70)	80000 PSI (X80)	90000 PSI (4140HR)	100000 PSI (4140SR)	110000 PSI (P110)
6	10,10S	3300	725	850	975	1125	1275	1450	1700	1950	2175	2425	2650
	40,STD,40S	3600	1875	2200	2500	2875	3250	3600	3600	3600	3600	3600	3600
	80,XS,80S	4000	3475	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000
	120	3900	3900	3900	3900	3900	3900	3900	3900	3900	3900	3900	3900
	160	3850	3850	3850	3850	3850	3850	3850	3850	3850	3850	3850	3850
	XXH	3700	3700	3700	3700	3700	3700	3700	3700	3700	3700	3700	3700
8	10,10S	3200	500	575	675	775	875	1000	1150	1325	1500	1650	1825
	20	3350	975	1125	1300	1475	1675	1925	2250	2575	2900	3200	3350
	30	3400	1100	1300	1475	1700	1925	2200	2575	2950	3300	3400	3400
	40,STD,40S	3475	1350	1575	1800	2075	2350	2700	3150	3475	3475	3475	3475
	60	3625	1875	2175	2500	2875	3225	3625	3625	3625	3625	3625	3625
	80,XS,80S	3800	2525	2950	3375	3800	3800	3800	3800	3800	3800	3800	3800
	100	3725	3350	3725	3725	3725	3725	3725	3725	3725	3725	3725	3725
	120	3725	3725	3725	3725	3725	3725	3725	3725	3725	3725	3725	3725
	140	3925	3925	3925	3925	3925	3925	3925	3925	3925	3925	3925	3925
	160	3825	3825	3825	3825	3825	3825	3825	3825	3825	3825	3825	3825
	XXH	3750	3750	3750	3750	3750	3750	3750	3750	3750	3750	3750	3750
10	10,10S	2725	375	450	500	575	650	750	875	1000	1125	1250	1375
	20	2800	650	750	850	975	1100	1275	1475	1675	1900	2100	2325
	30	2875	825	975	1100	1275	1450	1650	1925	2200	2475	2750	2875
	40,4STD,40s	2950	1050	1225	1400	1600	1825	2100	2450	2775	2950	2950	2950
	60,XS,80S	3100	1625	1900	2175	2500	2825	3100	3100	3100	3100	3100	3100
	80	3225	2100	2450	2800	3225	3225	3225	3225	3225	3225	3225	3225
	100	3400	2825	3275	3400	3400	3400	3400	3400	3400	3400	3400	3400
	120	3425	3425	3425	3425	3425	3425	3425	3425	3425	3425	3425	3425
	140,XXH	3475	3475	3475	3475	3475	3475	3475	3475	3475	3475	3475	3475
	160	3475	3475	3475	3475	3475	3475	3475	3475	3475	3475	3475	3475
12	10,10S	2300	325	375	425	475	525	625	725	825	925	1025	1125
	20	2375	475	550	625	700	800	925	1075	1225	1375	1525	1675
	30	2425	675	775	900	1025	1150	1325	1550	1775	1975	2200	2425
	STD,40S	2475	800	925	1050	1200	1375	1575	1825	2100	2350	2475	2475
	40	2500	875	1025	1175	1350	1525	1750	2050	2325	2500	2500	2500
	XS,80S	2575	1175	1375	1575	1800	2025	2350	2575	2575	2575	2575	2575
	60	2725	1400	1625	1850	2125	2400	2725	2725	2725	2725	2725	2725
	80	2850	1875	2200	2500	2850	2850	2850	2850	2850	2850	2850	2850
	100	2900	2575	2900	2900	2900	2900	2900	2900	2900	2900	2900	2900
	120,XXH	2950	2950	2950	2950	2950	2950	2950	2950	2950	2950	2950	2950
	140	2950	2950	2950	2950	2950	2950	2950	2950	2950	2950	2950	2950
	160	3025	3025	3025	3025	3025	3025	3025	3025	3025	3025	3025	3025

Table 3: Maximum Allowable Pressures (MAP) Continued

NPS Nominal Pipe Size	PIPE SCHEDULE	MAX PLUG BACK PRESSURE RATING (PSI) (NOT TO EXCEED)	MAXIMUM ALLOWABLE PRESSURE FOR GripSafe ST PLUGS IN PIPE BASED ON PIPE YIELD STRENGTH - SELECT THE COLUMN BELOW THAT IS LESS THAN OR EQUAL TO PIPE YIELD STRENGTH (PSI) -										
			30000 PSI (A106 A)	35000 PSI (A106 B)	40000 PSI (A106 C)	46000 PSI (X46)	52000 PSI (X52)	60000 PSI (X60)	70000 PSI (X70)	80000 PSI (X80)	90000 PSI (4140HR)	100000 PSI (4140SR)	110000 PSI (P110)
14	10S	1925	275	325	375	425	475	550	625	725	800	900	1000
	10	1950	400	450	525	600	675	775	900	1025	1150	1300	1425
	20	1975	525	600	700	800	900	1025	1200	1375	1550	1725	1900
	30,STD,40S	2025	675	775	875	1025	1150	1325	1550	1750	1975	2025	2025
	40	2050	825	950	1100	1250	1425	1625	1900	2050	2050	2050	2050
	XS,80S	2100	1000	1150	1325	1500	1700	1975	2100	2100	2100	2100	2100
	60	2425	1275	1475	1675	1925	2175	2425	2425	2425	2425	2425	2425
	80	2550	1775	2075	2375	2550	2550	2550	2550	2550	2550	2550	2550
	100	2725	2525	2725	2725	2725	2725	2725	2725	2725	2725	2725	2725
	120	2750	2750	2750	2750	2750	2750	2750	2750	2750	2750	2750	2750
	140	2800	2800	2800	2800	2800	2800	2800	2800	2800	2800	2800	2800
	160	2825	2825	2825	2825	2825	2825	2825	2825	2825	2825	2825	2825
16	10S	1950	225	250	300	325	375	425	500	575	650	700	775
	10	1975	300	350	400	475	525	600	700	800	900	1000	1100
	20	2000	425	475	550	625	700	825	950	1075	1225	1350	1475
	30,STD,40S	2025	525	600	700	800	900	1025	1200	1375	1550	1725	1900
	40,XS,80S	2100	775	900	1025	1175	1325	1525	1775	2050	2100	2100	2100
	60	2200	1125	1325	1500	1725	1950	2200	2200	2200	2200	2200	2200
	80	2300	1650	1925	2200	2300	2300	2300	2300	2300	2300	2300	2300
	100	2350	2250	2350	2350	2350	2350	2350	2350	2350	2350	2350	2350
	120	2400	2400	2400	2400	2400	2400	2400	2400	2400	2400	2400	2400
	140	2500	2500	2500	2500	2500	2500	2500	2500	2500	2500	2500	2500
	160	2525	2525	2525	2525	2525	2525	2525	2525	2525	2525	2525	2525
18	10S	1725	175	200	225	275	300	350	400	450	525	575	625
	10	1750	250	300	325	375	425	500	575	650	750	825	900
	20	1775	325	400	450	500	575	650	775	875	975	1100	1200
	STD,40S	1800	425	500	550	650	725	825	975	1100	1250	1375	1525
	30	1825	525	600	700	800	900	1025	1200	1375	1550	1700	1825
	XS,80S	1850	625	725	825	950	1075	1225	1450	1650	1850	1850	1850
	40	1975	725	850	975	1125	1275	1450	1700	1950	1975	1975	1975
	60	2025	1100	1300	1475	1700	1925	2025	2025	2025	2025	2025	2025
	80	2100	1550	1800	2075	2100	2100	2100	2100	2100	2100	2100	2100
	100	2175	2150	2175	2175	2175	2175	2175	2175	2175	2175	2175	2175
	120	2175	2175	2175	2175	2175	2175	2175	2175	2175	2175	2175	2175
	140	2275	2275	2275	2275	2275	2275	2275	2275	2275	2275	2275	2275
	160	2350	2350	2350	2350	2350	2350	2350	2350	2350	2350	2350	2350
20	10S	1550	175	200	225	275	300	350	400	450	525	575	625
	10	1550	200	250	275	325	350	400	475	550	600	675	750
	20,STD,40S	1600	350	400	475	525	600	700	800	925	1025	1150	1250
	30,XS,80S	1650	525	600	675	775	875	1025	1200	1350	1525	1650	1650
	40	1850	650	775	875	1000	1125	1300	1525	1725	1850	1850	1850
	60	1875	1025	1200	1375	1575	1775	1875	1875	1875	1875	1875	1875
	80	1925	1475	1725	1925	1925	1925	1925	1925	1925	1925	1925	1925
	100	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
	120	2050	2050	2050	2050	2050	2050	2050	2050	2050	2050	2050	2050
	140	2075	2075	2075	2075	2075	2075	2075	2075	2075	2075	2075	2075
	160	2125	2125	2125	2125	2125	2125	2125	2125	2125	2125	2125	2125

24	10,10S	1300	150	175	200	225	250	300	350	400	450	500	550
	20,STD,40S	1325	250	300	350	400	450	500	575	675	750	825	925
	XS,80S	1350	375	425	500	575	650	750	850	975	1100	1225	1350
	30	1550	450	500	575	675	750	875	1000	1150	1300	1450	1550
	40	1575	575	675	775	875	1000	1150	1350	1525	1575	1575	1575
	60	1625	950	1125	1275	1450	1625	1625	1625	1625	1625	1625	1625
	80	1650	1350	1575	1650	1650	1650	1650	1650	1650	1650	1650	1650
	100	1700	1700	1700	1700	1700	1700	1700	1700	1700	1700	1700	1700
	120	1725	1725	1725	1725	1725	1725	1725	1725	1725	1725	1725	1725
	140	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
	160	1825	1825	1825	1825	1825	1825	1825	1825	1825	1825	1825	1825

If the pipe ID is within 0.200” of the max ID Range, a 1/8” concentricity alignment between the plug OD and the pipe ID must be maintained to obtain the max pressure rating.

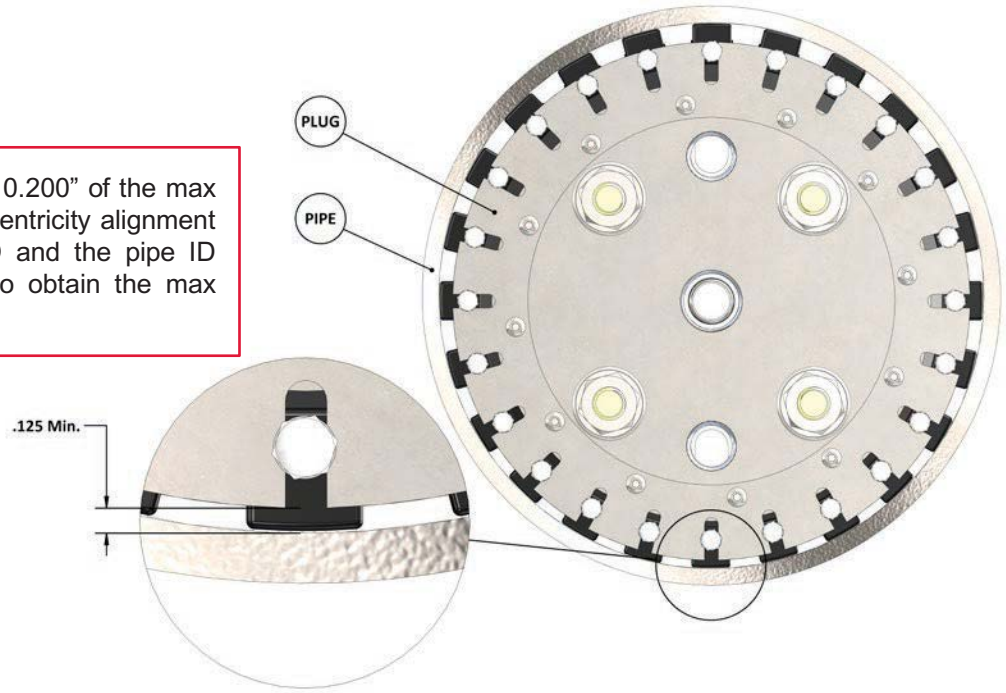


Figure 3: GripSafe ST Plug and Pipe Concentricity

5. Preparing the GripSafe ST DBB Plug for Installation

5.1 The GripSafe ST DBB should arrive in the factory-set “Ready to Install” position.

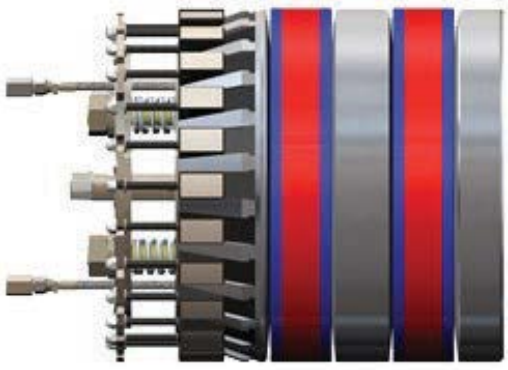


Figure 4:
“Not Ready to Install” State (Retracted)

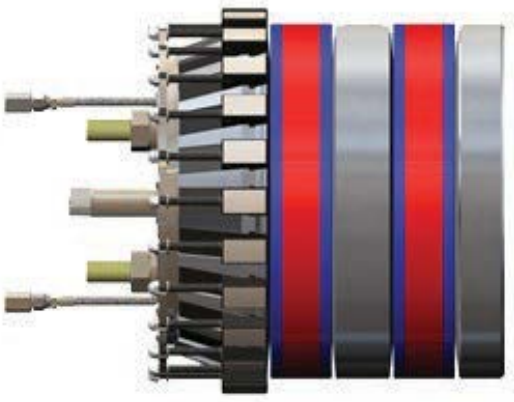


Figure 5:
“Ready to Install” State (Energized)

- Tighten the Compression Hex Nuts (18) until the Spring Plate Hub (20) is energized and flush against the Retainer Plate (17).
- Avoid over-tightening the nuts to the point where the Seal (10) swells or extrudes beyond the plug's outer diameter.
- In the "Ready to Install" state (see Figure 5), the GripSafe ST plug will grip the pipe immediately upon insertion.

CAUTION: Ensure the plug is free of debris and contaminants. Each **Wedge Gripper (5)** should slide smoothly with full motion and no resistance. Impeded movement can prevent proper gripping on the pipe's ID, risking ejection under pressure and potentially causing injury, material loss, or equipment damage.

6. Installing the GripSafe ST DBB Plug

CAUTION: Ensure the pipe's I.D. is clean, removing loose debris down to the deepest installation point of the plug. If the pipe is lined or contains an irremovable product, **STOP** and contact USA Industries for assistance before proceeding. Neglecting this step may hinder the wedges' grip, leading to potential plug ejection under pressure. Always wear appropriate PPE and adhere to site guidelines.

6.1 Insert the GripSafe ST DBB plug evenly into the pipe.

- See **Table 2** for Operational ID Range and clearance requirements.
- If using GripSafe ST **Lifting Device**, see **Section 8**.
- When the **Gripping Wedges (5)** meet the pipe I.D., evenly push the GripSafe ST DBB plug further into the pipe.
- A gentle rocking motion will aid in the insertion.
- Once the **Gripping Wedges (5)** begin entering the pipe, each will make independent contact with the pipe's I.D. At this point, retraction or removal of the plug is only possible if the **Compression Nuts (18)** are loosened. Refer to Section 7 for plug removal instructions

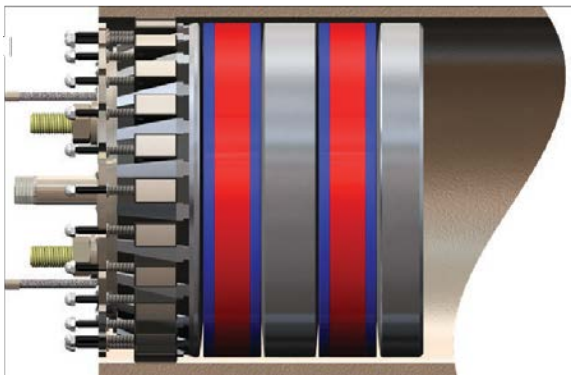


Figure 6: GripSafe ST DBB Minimum Insertion Depth in a Sectioned Pipe

- Insert plug until the top of the **Spring Plate Hub (20)** is at least flush with the end of the pipe (see **Figure 6**).
- If insertion in the "Ready to Install" state (see Figure 5) is difficult, try the "Not Ready to

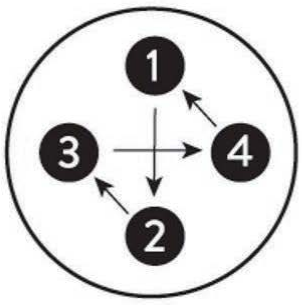
Install" state (see Figure 4). Loosen all **Compression Hex Nuts (18)** on their **All-Thread Shafts (11)** without completely removing them. This will fully retract the **Gripping Wedges (5)**, allowing the plug to be inserted freely into the pipe.

CAUTION: In this orientation, the plug will not grip the pipe immediately upon insertion. It will only secure the grip after tightening the **Compression Hex Nuts (18)** while the plug is inside the pipe, allowing the bottom of the **Spring Plate Hub (20)** to contact the top of the **Retainer Plate (17)**. Follow Step 6.2 to proceed with installation.

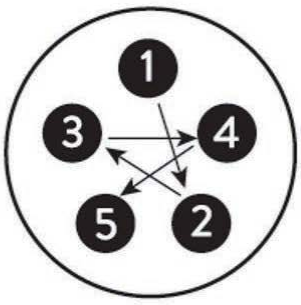
TEMPERATURE NOTE: When welding on the pipe with the plug installed, position the front face of the plug's **Spring Plate Hub (20)** at least 6" from the center of the active weld to prevent seal degradation or failure from melting. For post-weld heat treatments, maintain a minimum distance of 12" from the heating element, ensuring that the temperature at the plug's installation depth does not exceed 220°F. For high-temperature bake-outs (400°F or higher), increase the installation depth as much as possible. Continuously monitor the pressure behind the plug and between the seals, stopping work immediately if any pressure drop occurs. Additionally, always check the external surface temperature of the pipe at the seal location to prevent seal damage.

6.2 Evenly tighten the Compression Hex Nuts (18)

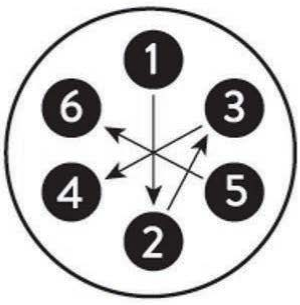
- Using a star pattern (see Figure 7), tighten each **Compression Hex Nut (18)** to a maximum of 3 full revolutions before moving to the next one. Repeat this process until you achieve 50% of the target torque on all nuts, then increase to 100% of the target installation torque, continuing in the star pattern. After finishing the star pattern at 100% torque, use a circular pattern to verify that all nuts are properly torqued.
- Minimal torque is needed for the initial passes, but torque will significantly increase once the **Seals (10)** start compressing against the pipe's ID



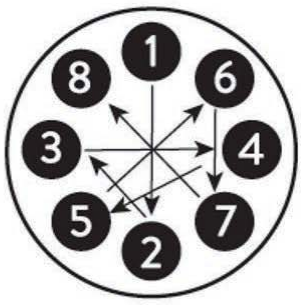
4 Compression Hex Nut Tightening Pattern



5 Compression Hex Nut Tightening Pattern



6 Compression Hex Nut Tightening Pattern



8 Compression Hex Nut Tightening Pattern

NOTE: To center the plug in the pipe, tighten the two bottom **Compression Hex Nuts (18)** to expand the **Seals (10)** beneath them, lifting the plug into position. A brief push will reset the **Wedge Grippers (5)** to match the new centered position of the plug body. Normal installation should begin once the plug is centered. This adjustment is particularly useful if the plug is noticeably off-center, if maximum compression torque is not achieving test pressures, or if the plug is outside the 1/8" concentricity limit for pipes with an ID close to the maximum range of 0.200"

6.3 Verify the integrity of the Seals (10).

- For pressure testing, connect the hydro test pump to the **Backpressure Vent Port (19)** using the appropriate fittings. If not testing, seal the system with a cap or use a back pressure monitoring tee.
- Increase the pressure to 25% of the target pressure or 150 psig, whichever is lower. A pressure drop may not indicate leakage, as the **Seals (10)** will creep under pressure until fully seated, increasing the test volume. For small test volumes, this may result in a noticeable gradual pressure loss. To stabilize the seals, reapply pressure until it becomes stable. Seal creep can also occur at full pressure, and the same approach applies to resolve it during integrity verification.

CAUTION: When using the plug for pressure testing, closely monitor the travel of the **Wedge Gripper Nuts (3)**. As shown in Figure 8, you can add pressure to the system when the **Wedge Gripper Nuts (3)** are still far from the **Spring Plate Halo (15)**. However, in Figure 9, no additional pressure should be added once the **Wedge Gripper Nuts (3)** reach their maximum travel.

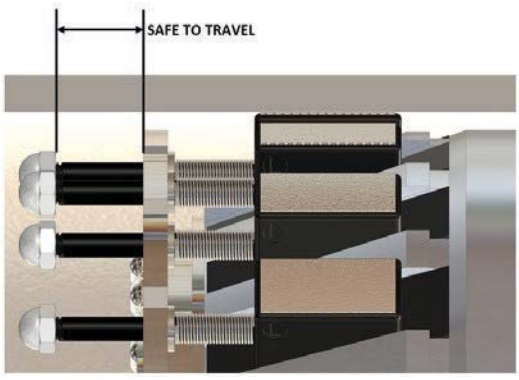


Figure 8: Wedge Grippers Safe to Travel

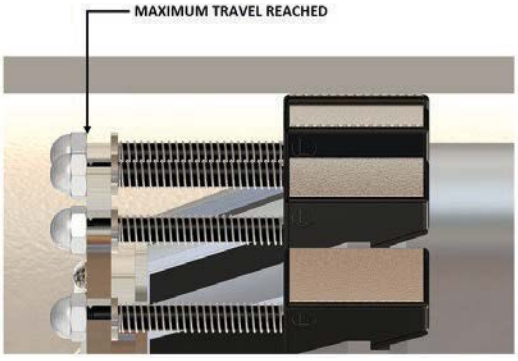


Figure 9: Wedge Grippers Maximum Travel Reached

- Consider attaching a gauge and vent hose assembly, or a back pressure monitoring tee, to the **Backpressure Vent Port (19)** to safely release any back pressure. The hose should be long enough to direct vapor away from personnel. A valve can also be connected to allow for safe back pressure removal before plug extraction (see Section 7). If using a monitoring tee, place a pressure gauge on the branch side and connect the run side to the **Backpressure Vent Port (19)** with a ball valve. You can enhance safety by attaching a hose to the ball valve and venting it to a safe location away from workers.

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

CAUTION: Never stand directly in front of the GripSafe ST DBB plug at any time. This precaution applies regardless of whether the plug is under back pressure.

6.4 The GripSafe ST plug is now ready to accept back pressure. Observe pressure ratings listed in Table 3.

CAUTION: If you hear popping or clicking during hydro testing, **STOP IMMEDIATELY** and slowly release the pressure. These sounds may indicate Wedge Gripper slippage, cracking, or component failure. Remove the plug and inspect for damage. Contact USA Industries for assistance.

CAUTION: Refer to Table 3: **Maximum Allowable Pressure** in this manual and **DO NOT EXCEED** the specified ratings when pressurizing the pipe. Monitor the area where the **Wedge Grippers (5)** make contact during the hydro test. If you notice any deformation or swelling of the pipe, **STOP IMMEDIATELY** and slowly release the pressure. Contact USA Industries for assistance

7. Positioning for Between the Seal Hydro Testing

7.1 If using the plug for hydrostatic testing of a weld, ensure the proper depth of insertion by following this method:

1. Measure the distance from the pipe or fitting end to the center of the weld area to determine the **Weld Zone Depth**.
2. Refer to Table 4 to obtain the **Plug Insertion Depth** for the Weld Neck Flange being tested.
3. Subtract the Plug Insertion Depth from the Weld Zone Depth.
4. If the result is negative, insert the plug while measuring from the pipe or fitting end to the top of the **Spring Plate Hub/Halo (15)/(20)**. Stop when the measurement matches the difference calculated in Step 3.

Example: Testing a weld on a 14” Class 150 Weld Neck Flange.

- Weld Zone Depth: 5.00”
- 12” Class 150 Plug Insertion Depth obtained from Table 4: 6.14”
- Weld Zone Depth – Plug Insertion Depth = 5.00 – 6.14 = -1.14

From the calculation, the top face of the **Spring Plate Hub/Halo (15)/(20)** should be 1.14” out past the end of the weld neck flange (see Figure 8).

5. If the result is a positive number, measure from the pipe or fitting end into the pipe or fitting by the amount found in Step 3 and mark the ID of the pipe or fitting. Insert the plug until the top of the Spring Plate Hub/Halo (15)/(20) is aligned with this mark.

Example: Testing a weld on a 14” Class 600 Weld Neck Flange.

- Weld Zone Depth: 8.38”
- 12” Class 600 Plug Insertion Depth obtained from Table 4: 6.63”
- Weld Zone Depth – Plug Insertion Depth = 8.38 – 6.63 = 1.75”

From the calculation, the top face of the Spring Plate Hub/Halo (15)/(20) should be 1.75” into the weld neck flange’s end (see Figure 9)

TABLE 4: GRIPSAFE ST ORB DBB DEPTH INSERTION

Nominal Plug Size (in)	GripSafe ORB DBB Depth Insertion Per Weld Neck Class						
	Class 150	Class 300	Class 400	Class 600	Class 900	Class 1500	Class 2500
6	4.58	4.95	5.14	5.44	5.44	5.44	5.44
8	5.08	5.45	5.56	5.56	5.56	5.56	5.56
10	5.14	5.63	5.63	5.63	5.63	5.63	5.63
12	5.63	5.63	5.63	5.63	5.63	5.63	5.63
14	6.14	6.63	6.63	6.63	6.63	6.63	N/A
16	6.14	6.63	6.63	6.63	6.63	6.63	N/A
18	6.63	6.63	6.63	6.63	6.63	6.63	N/A
20	6.75	6.75	6.75	6.75	6.75	6.75	N/A
24	6.75	6.75	6.75	6.75	6.75	6.75	N/A

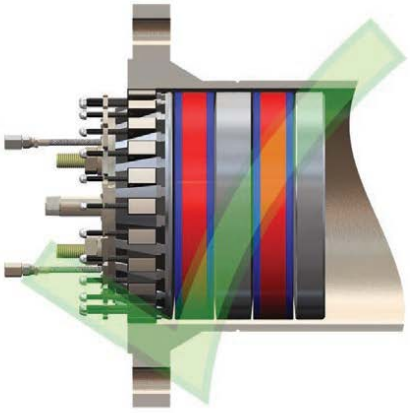


Figure 10: Permissible Insertion Depth with back pressure Rating

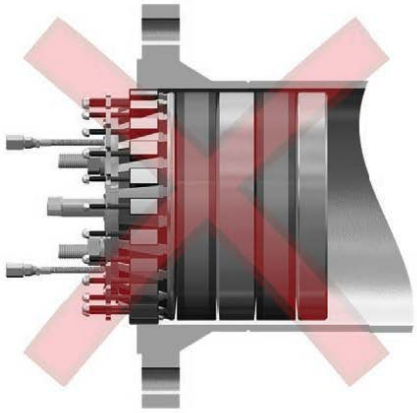


Figure 11: Impermissible Insertion Depth with No back pressure Rating

CAUTION:

Gripping failure can occur if the Gripping Wedges are not fully inserted into the pipe or fitting. If any part of the Wedge Gripper's surface is visible beyond the pipe or fitting end (as shown in Figure 11), the GripSafe ST plug may not hold back pressure. Ensure the plug is fully advanced so that no part of the Wedge Gripper is visible (see Figure 10).

Be careful not to cover the weld area with the Seal, as this could lead to inaccurate hydrotest results. If the plug is misaligned, tighten the two bottom Compression Hex Nuts to expand the Seal beneath them, which will help lift and center the plug. A slight push on the plug will reset the Wedge Grippers to accommodate this new centered position.

Normal installation should proceed once the plug is centered, especially if it is noticeably off-center, test pressures are not achieved at Maximum Compression Torque, or if the plug exceeds the 1/8" concentricity limit when the pipe ID is within 0.200" of maximum range.

8. GripSafe ST DBB Plug Removal

8.1 Depressurize the system using the hydro test pump and drain all the water from the Test Vent Port and Test Fill Port.

8.2 Remove hydro test equipment and or gauges from the Test Ports (1)

NOTE: Take care to avoid unthreading or loosening the **Test Ports (1)** while removing the hydro testing equipment. Failure to do so may lead to internal leaks during future use of the plug. Always use appropriately sized wrenches.

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

CAUTION: SLOWLY open the **Vent Port (19)** to relieve back pressure, taking care when opening valves or loosening fittings to avoid hazardous pressure flow or violent projectiles that could injure personnel or damage equipment. If using a back pressure monitoring tee, be cautious of hose whip caused by fast-flowing gases or liquids, as it can also lead to injury or equipment damage.

8.4 Loosen the Compression Hex Nuts (18) in an even star pattern to evenly distribute the load across all bolts.

- If a **Compression Hex Nut (18)** spins freely while loosening, return it to flush with the top of the **Spring Plate (20)**. The **Seal (10)** functions like a spring and contains significant force, which is too much for a single **All-Threaded Shaft (11)** to bear.
- After the seal has detached from the pipe ID, keep loosening the **Compression Hex Nuts (18)** until they are level with the top of the **All-Threaded Shaft (11)**.

NOTE: Do not remove the **Compression Hex Nut (18)** from the **All-Threaded Shaft (11)**. If this happens, immediately reinstall the components.

CAUTION: Ensure all **Compression Hex Nuts (18)** remain loaded throughout the loosening process. If only one nut is loose, it places excessive stress on a single **All-Threaded Shaft (11)**, increasing the risk of breakage. Once the **Seals (10)** have relaxed enough to detach from the pipe ID, the plug is in a more relaxed state, allowing for complete loosening of the **Compression Hex Nuts (18).**

8.5 Remove the GripSafe ST DBB plug from the pipe.

- Clean and store for later use or return to USA Industries.
- Store in a shaded area protected from temperatures above 150°F. Prolonged exposure to excessive heat can degrade seals over time.
- The **Wedge Gripper (5)** texture may accumulate pipe scale and rust after multiple uses. Regular inspection is essential to maintain optimal gripping strength. To clean, use mild dish soap and a stiff stainless-steel brush, like a welding brush. For stubborn deposits, apply a household rust remover with the brush. Rinse thoroughly with tap water and dry completely.

9. GripSafe ST Lifting Device

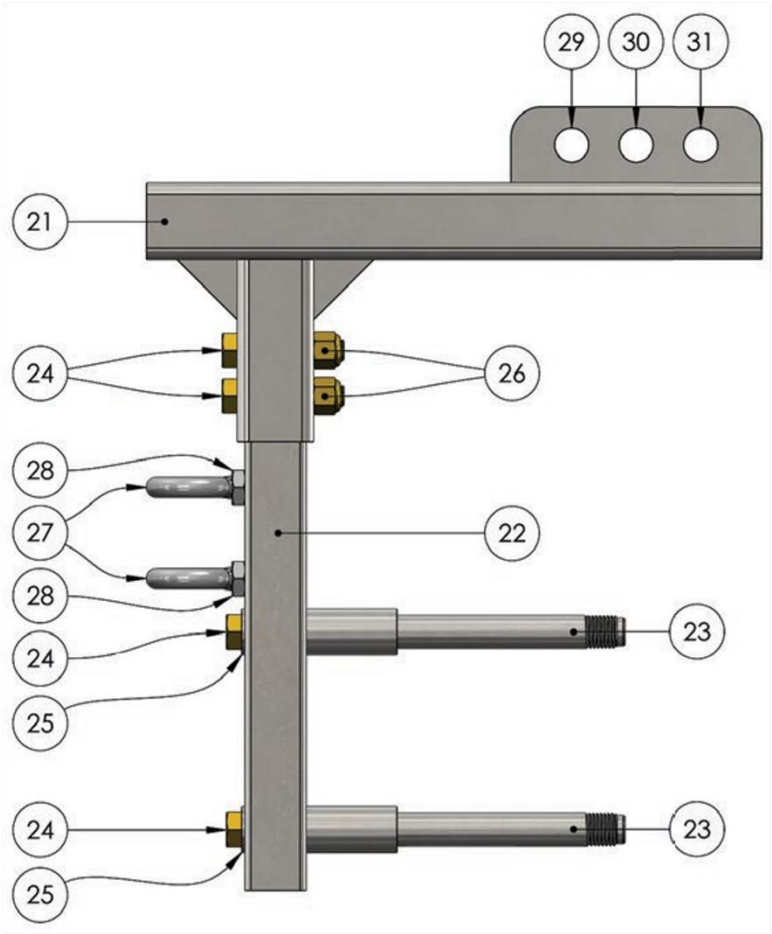


Figure 12: GripSafe ST Lifting Device Diagram

TABLE 5: LIFTING DEVICE BILL OF MATERIALS

Plug Size	(21) Universal Lifting Bar	(22) Telescoping Lifting Attachment #1	(23) Telescoping Lifting Attachment #2	(24) Telescoping Lifting Attachment #3	(25) Lifting Standoff #1	(26) Lifting Standoff #2	(27) Lifting Device Bolt	(28) Lifting Device Washer	(29) Lifting Device Nut	(30) Vertical Lifting Eyebolt	(31) Eyebolt Nut
10	1	1	N/A	N/A	2	N/A	4	2	2	2	2
12	1	1	N/A	N/A	2	N/A	4	2	2	2	2
14	1	N/A	1	N/A	N/A	2	4	2	2	2	2
16	1	N/A	1	N/A	N/A	2	4	2	2	2	2
18	1	N/A	1	N/A	N/A	2	4	2	2	2	2
20	1	N/A	N/A	1	N/A	2	4	2	2	2	2
24	1	N/A	N/A	1	N/A	2	4	2	2	2	2

9.1 Installing the Lifting Device on the GripSafe ST DBB 10” – 12” plugs.

- Remove the **MJIC-FNPT Adapter (1)** from the **Vent Hose (2)**. The internal thread for the lifting device on 10”-12” plugs are in the holes where the **Vent Hoses (2)** originate.
- Insert the **Vent Hose (2)** into the hole of the **Lifting Standoff (23)** (see Figure 13).
- Insert the **Lifting Standoffs (23)** into the two holes located on top of the **Spring Plate Hub (20)**. Hand tighten both **Lifting Standoffs (23)** until they bottom out (see Figure 13).

CAUTION: Thread the **Lifting Standoffs (23)** into the GripSafe ST DBB plug for at least 6 full turns. Not doing so may lead to Lifting Threads failing under the plug’s load, risking injury to personnel and damage to equipment.

9.2 Installing the Lifting Device on the GripSafe ST DBB 14”+ plugs.

- On GripSafe ST DBB 14”+, the internal threads for the lifting device are located between the back pressure **Vent Port (19)** and **Vent Hose Ports (2)** (see Figure 14).
- Insert the **Lifting Standoffs (23)** into the two holes through the **Spring Plate Hub (20)**. Hand tighten both **Lifting Standoffs (23)** until they bottom out (see Figure 14).

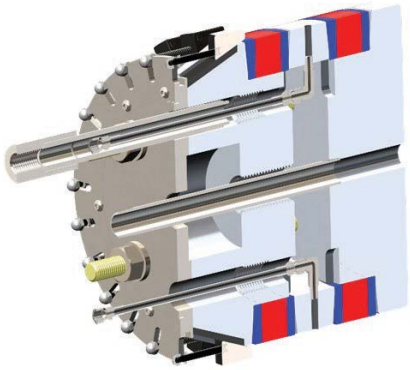


Figure 13: Inserting and Threading **Lifting Standoffs** into the DBB 10” - 12” Plug

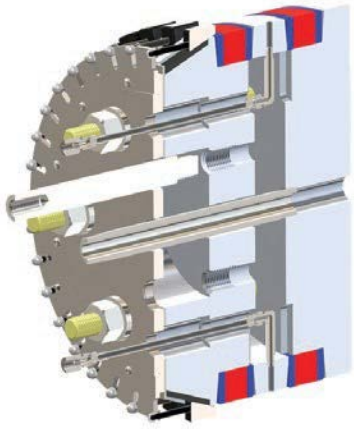


Figure 14: Inserting and **Threading Lifting Standoffs** in to the DBB Plug 14”+

- Line up the holes on the Telescoping Lifting Attachment (22) with the internally threaded holes on the Lifting Standoffs (23). Fasten the Telescoping Lifting Attachment (22) on to the Lifting Standoffs (23) with the provided Lifting Device Bolts (24) and Washers (25) (see Figure 15 on next page).

NOTE: There are 3 sizes of **Telescoping Lifting Attachment (22)**, #1, #2, #3. Each have different lengths and mounting hole locations to accommodate distinct plug sizes. Refer to Table 5 for details.

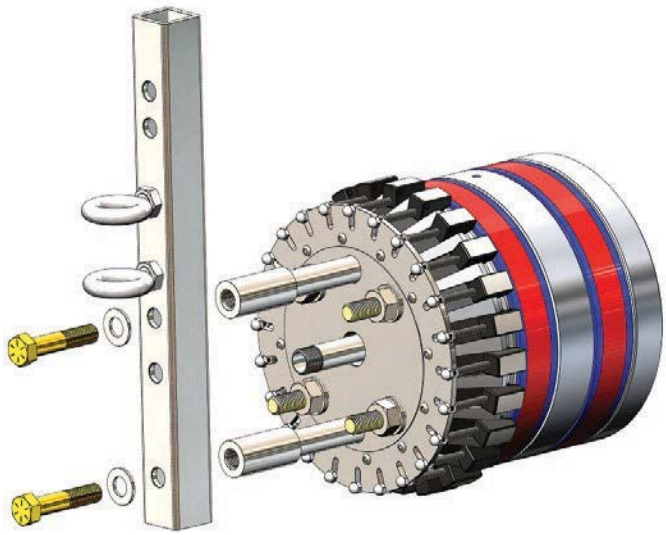


Figure 15: Aligning and fastening **Telescoping Lifting Attachment** on to **Lifting Standoffs**

- After fastening the Telescoping Lifting Attachment (22) to the Lifting Standoffs (23), slide it into the Universal Lifting Bar's (21) shorter square tubing. Upon insertion, align the two holes on both the Telescoping Lifting Attachment (22) and the Universal Lifting Bar (20).
- Fasten the Telescoping Lifting Attachment (22) with the provided Lifting Bolts

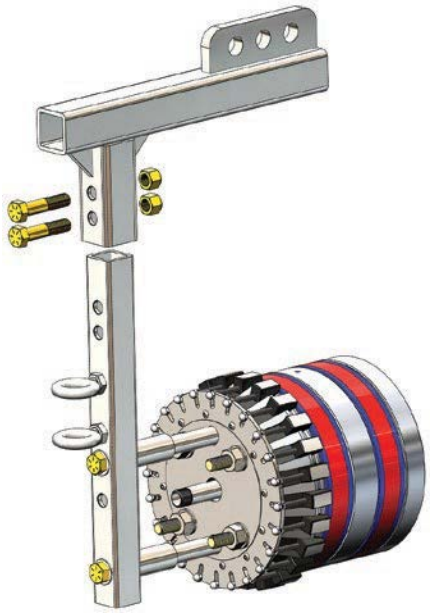


Figure 16: Aligning and Fastening **Telescoping Lifting Attachment** onto **Universal Lifting Bar**

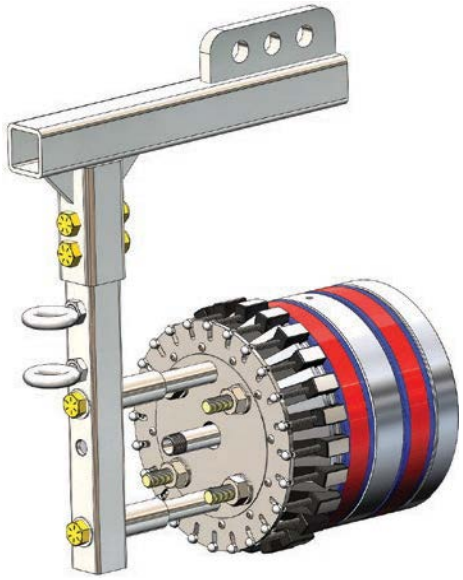


Figure 17: Lifting Device Finished Assembly

9.3 Using Lifting Device

- There are three **Anchor Holes (29),(30),**and **(31)** on the **Lifting Device**. Use one or two of the three anchor holes to orient the GripSafe ST DBB plug horizontally.
- If none of the three holes comes close to the center gravity of the plug, a **Cheater Bar** may be inserted in the long square tubing portion of the **Universal Lifting Bar (20)** and used as leverage. A **Cheater Bar** can also be used to help manipulate the plug while inserting it into the pipe.

9.4 Vertical Lifting

- For vertical lifting, remove the **Vertical Lifting Device Bolts (27)** that are holding the **Lifting Standoffs (26)** to the **Telescoping Lifting Attachment (25)**.
- Fasten the provided **Vertical Lifting Eyebolt (30)** and **Eyebolt Nut (31)** to both **Lifting Standoffs (26)**. Note, the **Vertical Lifting Eyebolts (30)** thread is ¾-10.
- While holding the **Vertical Lifting Eyebolt (30)** in the correct orientation, snug its **Eyebolt Nut (31)** against the top of the **Lifting Standoffs (26)** and turn the **Eyebolt Nut (31)** an additional ½ turn. Do the same to the other **Vertical Lifting Eyebolt (30)** and its **Eyebolt Nut (31)**. See Figure 18 for properly installed **Vertical Lifting Eyebolts (30)** and **Eyebolt Nuts (31)** illustration.
- When lifting vertically, both **Vertical Lifting Eyebolts (30)** and **Eyebolt Nuts (31)** must be used.

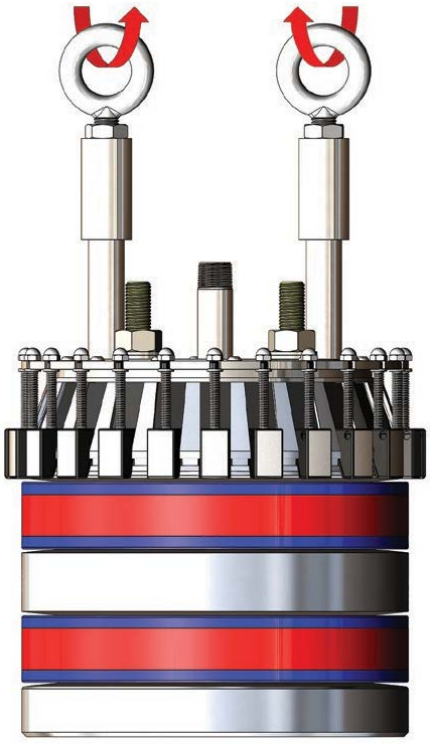


Figure 18: Properly Installed Lifting Eyes for Vertical Lifting

CAUTION: A minimum of 6 full turns is needed when threading both **Vertical Lifting Eyebolts (30)** and **Eyebolt Nuts (31)** into the **Lifting Standoffs (23)**. Failure to ensure the **Vertical Lifting Eyebolts (30)** and **Eyebolt Nuts (31)** are fully threaded-in may cause the mating threads to fail under the load of the GripSafe ST causing it to fall and potentially injuring personnel and damaging equipment.

CAUTION: Lifting the GripSafe ST with only one **Vertical Lifting Eyebolt (30)** and **Eyebolt Nut (31)** is not recommended. Failing to lift the plug with both **Vertical Lifting Eyebolts (30)** and **Eyebolt Nuts (31)** could cause the plug to twist and turn which could lead to the **Vertical Lifting Eyebolts (30)** and **Eyebolt Nuts (31)** unthreading/loosening causing it to fall and potentially injuring personnel and damaging equipment.