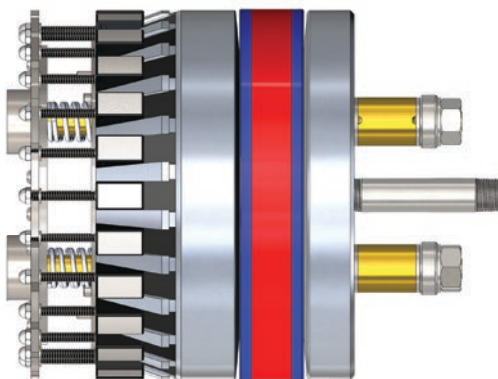




GRIPSAFE®

INSTALLATION MANUAL



Large Inboard Insertion Blocking (IIB) Reverse Pressure Plug

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

Patents & Trademarks

- US PATENTS: 9,927,058 | 9,810,364 | D894,349 | 10,746,339
- CANADIAN PATENT: 3,004,787
- CANADIAN INDUSTRIAL DESIGN: CA 186293
- EUROPEAN PATENT: 3,377,797 B1
- EUROPEAN PATENT [Germany]: 602016051864.3
- EUROPEAN UNION DESIGN REGISTRATION: 00628264-001
- INTERNATIONAL TRADEMARK REGISTRATION: 1550298
- Other US and Foreign Patents Pending

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1. Introduction

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



WARNING: Do not use GripSafe 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, Inc. 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 plug in metallic piping. If the intended use of this plug is for any piping other than metallic piping, please contact USA Industries, Inc.’s Customer Service Department for technical support.

2. Safety

- ⚠ Failure to follow proper safety requirements may result in the GripSafe plug failing, which could lead to injury, material loss, and/or damage to equipment.
- ⚠ Wear proper Personal Protective Equipment (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; i.e. weldolet, tee, etc.
- ⚠ Use care in the handling of the *Wedge Studs*. Never beat, hammer, or pry on the *Wedge Studs*, and never remove the nut located on the *Wedge Studs*.
- ⚠ Pressure testing can be a hazardous operation and safety precautions are important. Never stand or pass in front of a test plug during installation, testing, and removal.
- ⚠ Do not make 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; never apply pressure on the non-rated side of the plug.
- ⚠ Maximum plug back pressure rating references the plugs ultimate holding capacity. Never exceed the pressure capacity of the weakest component in a pressurized system. Study your system's components prior to beginning a pressure test to ascertain and confirm that the maximum test pressure your system is subjected to with the use of the GripSafe plug adheres to the limits given by *Table 3*, and is in accordance with all applicable industry and site-specific standards.
- ⚠ We recommend using water as the test medium. Before pressurizing the system, vent all gases from the vessel.
- ⚠ If performing pneumatic testing, all attempts to limit potential damage to personnel or equipment is critical. USA Industries, Inc. 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.
- ⚠ For Maximum Allowable Pressures refer to *Table 3*; DO NOT EXCEED the pressure ratings identified in this the table when pressurizing the system. Carefully observe the outside of the pipe at the location where the *Wedge Grippers* make contact when performing a hydro test. If you observe any deformation or swelling of the pipe, stop immediately and slowly release the pressure from the system. **Contact USA Industries, Inc. for further assistance.**
- ⚠ If you hear a popping or clicking sound at any time during a hydro test, stop immediately and slowly release the pressure from the system. Popping or clicking sounds during hydro testing may be a sign of the *Wedge Gripper* slipping, cracking, or one of the plug components failing. Remove the plug from the pipe or fitting and inspect for damage. **Contact USA Industries, Inc. for further assistance.**
- ⚠ The GripSafe IIB plug is designed to hold pressure originating from the installation side only.
- ⚠ Make sure the plug is clean of debris and contaminants. Each *Wedge Gripper* should freely slide up and down in its slot with a full range-of-motion, and incur no resistance. If you experience impeded movement due to debris, dirt or contaminants, the plug may not grip the pipe's ID securely, which can cause plug ejection under pressure, potentially leading to injury, death, material loss, and/or damage.
- ⚠ **For any questions or concerns, contact USA Industries, Inc. for technical assistance.**

3. Parts (This manual references the part numbers identified below throughout the document)

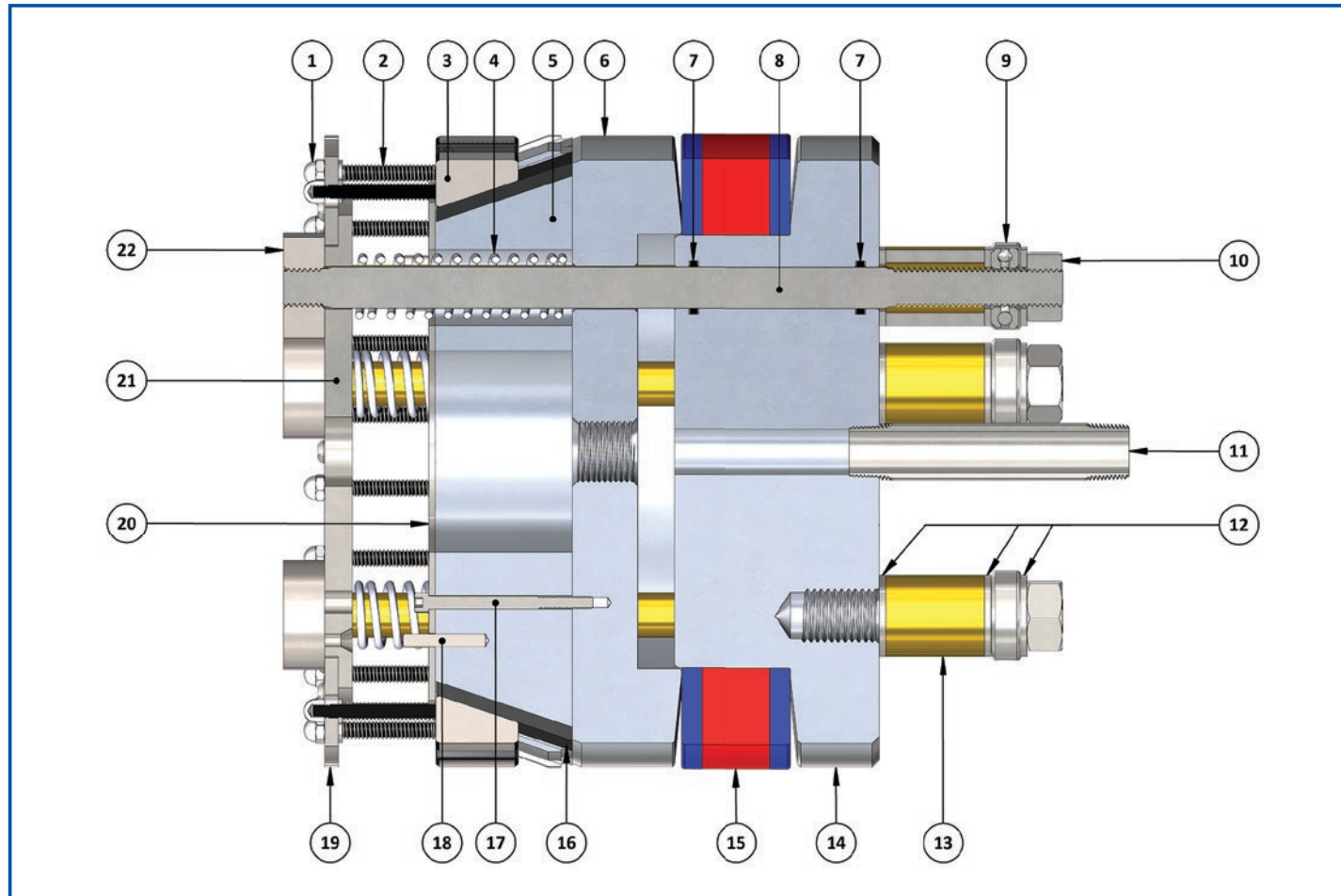


Figure 1: GripSafe IIB Parts Diagram

Table 1: GripSafe Bill of Materials

| Nominal Pipe Size (in) | Schedule | ① | ② | ③ | ④ | ⑤ | ⑥ | ⑦ | ⑧ | ⑨ | ⑩ | ⑪ | ⑫ | ⑬ | ⑭ | ⑮ | ⑯ | ⑰ | ⑱ | ⑲ | ⑳ | ㉑ | ㉒ |
|------------------------|----------|-------------------|--------------------|---------------|-------------------------------|------------|-----------------------|------------------|----------------|----------------|---------------------|-----------|---------------------|--------------------|--------------------------|------|------------|----------------------------|---------------------|-------------------|----------------|------------------|---------------|
| | | Wedge Gripper Nut | Wedge Gripper Stem | Wedge Gripper | Retraction Compression Spring | Wedge Cone | Top Compression Plate | X-Profile O-Ring | Threaded Shaft | Thrust Bearing | Compression Hex Nut | Vent Port | Compression Washers | Compression Spacer | Bottom Compression Plate | Seal | Back Plate | Wedge Cone Retaining Screw | Alignment Dowel Pin | Spring Plate Halo | Retainer Plate | Spring Plate Hub | Threaded Puck |
| 6 | 105-80S | 9 | 9 | 9 | 1 | 1 | 1 | 8 | 4 | 4 | 4 | 1 | 12 | 4 | 1 | 1 | 9 | 2 | 2 | 0 | 1 | 1 | 1 |
| | 120 | 8 | 8 | 8 | 1 | 1 | 1 | 8 | 4 | 4 | 4 | 1 | 12 | 4 | 1 | 1 | 8 | 2 | 2 | 0 | 1 | 1 | 1 |
| | 160 | 7 | 7 | 7 | 1 | 1 | 1 | 8 | 4 | 4 | 4 | 1 | 12 | 4 | 1 | 1 | 7 | 2 | 2 | 0 | 1 | 1 | 1 |
| | XXH | 6 | 6 | 6 | 1 | 1 | 1 | 8 | 4 | 4 | 4 | 1 | 12 | 4 | 1 | 1 | 6 | 2 | 2 | 0 | 1 | 1 | 1 |
| 8 | 105-80S | 15 | 15 | 15 | 1 | 1 | 1 | 8 | 4 | 4 | 4 | 1 | 12 | 4 | 1 | 1 | 15 | 2 | 2 | 0 | 1 | 1 | 1 |
| | 100 | 14 | 14 | 14 | 1 | 1 | 1 | 8 | 4 | 4 | 4 | 1 | 12 | 4 | 1 | 1 | 14 | 2 | 2 | 0 | 1 | 1 | 1 |
| | 120-140 | 13 | 13 | 13 | 1 | 1 | 1 | 8 | 4 | 4 | 4 | 1 | 12 | 4 | 1 | 1 | 13 | 2 | 2 | 0 | 1 | 1 | 1 |
| | 160-XXH | 12 | 12 | 12 | 1 | 1 | 1 | 8 | 4 | 4 | 4 | 1 | 12 | 4 | 1 | 1 | 12 | 2 | 2 | 0 | 1 | 1 | 1 |
| 10 | 105-100 | 20 | 20 | 20 | 4 | 1 | 1 | 8 | 4 | 4 | 4 | 1 | 12 | 4 | 1 | 1 | 20 | 2 | 2 | 1 | 1 | 1 | 4 |
| | 120 | 19 | 19 | 19 | 1 | 1 | 1 | 8 | 4 | 4 | 4 | 1 | 12 | 4 | 1 | 1 | 19 | 2 | 2 | 0 | 1 | 1 | 4 |
| | 140,XXH | 18 | 18 | 18 | 1 | 1 | 1 | 8 | 4 | 4 | 4 | 1 | 12 | 4 | 1 | 1 | 18 | 2 | 2 | 0 | 1 | 1 | 4 |
| | 160 | 17 | 17 | 17 | 1 | 1 | 1 | 8 | 4 | 4 | 4 | 1 | 12 | 4 | 1 | 1 | 17 | 2 | 2 | 0 | 1 | 1 | 4 |
| 12 | 105-80S | 24 | 24 | 24 | 4 | 1 | 1 | 8 | 4 | 4 | 4 | 1 | 12 | 4 | 1 | 1 | 24 | 2 | 2 | 1 | 1 | 1 | 4 |
| | 60-80 | 25 | 25 | 25 | 4 | 1 | 1 | 8 | 4 | 4 | 4 | 1 | 12 | 4 | 1 | 1 | 25 | 2 | 2 | 1 | 1 | 1 | 4 |
| | 100 | 24 | 24 | 24 | 4 | 1 | 1 | 8 | 4 | 4 | 4 | 1 | 12 | 4 | 1 | 1 | 24 | 2 | 2 | 1 | 1 | 1 | 4 |
| | 120,XXH | 23 | 23 | 23 | 4 | 1 | 1 | 8 | 4 | 4 | 4 | 1 | 12 | 4 | 1 | 1 | 23 | 2 | 2 | 1 | 1 | 1 | 4 |
| | 140 | 22 | 22 | 22 | 4 | 1 | 1 | 8 | 4 | 4 | 4 | 1 | 12 | 4 | 1 | 1 | 22 | 2 | 2 | 1 | 1 | 1 | 4 |
| 14 | 160 | 21 | 21 | 21 | 4 | 1 | 1 | 8 | 4 | 4 | 4 | 1 | 12 | 4 | 1 | 1 | 21 | 2 | 2 | 1 | 1 | 1 | 4 |
| | 105-80S | 24 | 24 | 24 | 6 | 1 | 1 | 12 | 6 | 6 | 6 | 1 | 18 | 6 | 1 | 1 | 24 | 4 | 2 | 1 | 1 | 1 | 6 |
| | 60-100 | 27 | 27 | 27 | 6 | 1 | 1 | 12 | 6 | 6 | 6 | 1 | 18 | 6 | 1 | 1 | 27 | 4 | 2 | 1 | 1 | 1 | 6 |
| | 120 | 26 | 26 | 26 | 6 | 1 | 1 | 12 | 6 | 6 | 6 | 1 | 18 | 6 | 1 | 1 | 26 | 4 | 2 | 1 | 1 | 1 | 6 |
| | 140 | 25 | 25 | 25 | 6 | 1 | 1 | 12 | 6 | 6 | 6 | 1 | 18 | 6 | 1 | 1 | 25 | 4 | 2 | 1 | 1 | 1 | 6 |
| 16 | 160 | 24 | 24 | 24 | 6 | 1 | 1 | 12 | 6 | 6 | 6 | 1 | 18 | 6 | 1 | 1 | 24 | 4 | 2 | 1 | 1 | 1 | 6 |
| | 105-80 | 32 | 32 | 32 | 6 | 1 | 1 | 12 | 6 | 6 | 6 | 1 | 18 | 6 | 1 | 1 | 32 | 4 | 2 | 1 | 1 | 1 | 6 |
| | 100 | 31 | 31 | 31 | 6 | 1 | 1 | 12 | 6 | 6 | 6 | 1 | 18 | 6 | 1 | 1 | 31 | 4 | 2 | 1 | 1 | 1 | 6 |
| | 120 | 30 | 30 | 30 | 6 | 1 | 1 | 12 | 6 | 6 | 6 | 1 | 18 | 6 | 1 | 1 | 30 | 4 | 2 | 1 | 1 | 1 | 6 |
| | 140 | 29 | 29 | 29 | 6 | 1 | 1 | 12 | 6 | 6 | 6 | 1 | 18 | 6 | 1 | 1 | 29 | 4 | 2 | 1 | 1 | 1 | 6 |
| 18 | 160 | 28 | 28 | 28 | 6 | 1 | 1 | 12 | 6 | 6 | 6 | 1 | 18 | 6 | 1 | 1 | 28 | 4 | 2 | 1 | 1 | 1 | 6 |
| | 105-80S | 36 | 36 | 36 | 6 | 1 | 1 | 12 | 6 | 6 | 6 | 1 | 18 | 6 | 1 | 1 | 36 | 4 | 2 | 1 | 1 | 1 | 6 |
| | 40-60 | 38 | 38 | 38 | 6 | 1 | 1 | 12 | 6 | 6 | 6 | 1 | 18 | 6 | 1 | 1 | 38 | 4 | 2 | 1 | 1 | 1 | 6 |
| | 80 | 37 | 37 | 37 | 6 | 1 | 1 | 12 | 6 | 6 | 6 | 1 | 18 | 6 | 1 | 1 | 37 | 4 | 2 | 1 | 1 | 1 | 6 |
| | 100 | 36 | 36 | 36 | 6 | 1 | 1 | 12 | 6 | 6 | 6 | 1 | 18 | 6 | 1 | 1 | 36 | 4 | 2 | 1 | 1 | 1 | 6 |
| | 120 | 35 | 35 | 35 | 6 | 1 | 1 | 12 | 6 | 6 | 6 | 1 | 18 | 6 | 1 | 1 | 35 | 4 | 2 | 1 | 1 | 1 | 6 |
| 18 | 140 | 34 | 34 | 34 | 6 | 1 | 1 | 12 | 6 | 6 | 6 | 1 | 18 | 6 | 1 | 1 | 34 | 4 | 2 | 1 | 1 | 1 | 6 |
| | 160 | 33 | 33 | 33 | 6 | 1 | 1 | 12 | 6 | 6 | 6 | 1 | 18 | 6 | 1 | 1 | 33 | 4 | 2 | 1 | 1 | 1 | 6 |



Table 1: GripSafe Bill of Materials Continued

| Nominal Pipe Size (in) | Schedule | ① | ② | ③ | ④ | ⑤ | ⑥ | ⑦ | ⑧ | ⑨ | ⑩ | ⑪ | ⑫ | ⑬ | ⑭ | ⑮ | ⑯ | ⑰ | ⑱ | ⑲ | ⑳ | ㉑ | ㉒ |
|------------------------|----------|-------------------|--------------------|---------------|-------------------------------|------------|-----------------------|------------------|----------------|----------------|---------------------|-----------|---------------------|--------------------|--------------------------|------|------------|----------------------------|---------------------|-------------------|----------------|------------------|---------------|
| | | Wedge Gripper Nut | Wedge Gripper Stem | Wedge Gripper | Retraction Compression Spring | Wedge Cone | Top Compression Plate | X-Profile O-Ring | Threaded Shaft | Thrust Bearing | Compression Hex Nut | Vent Port | Compression Washers | Compression Spacer | Bottom Compression Plate | Seal | Back Plate | Wedge Cone Retaining Screw | Alignment Dowel Pin | Spring Plate Halo | Retainer Plate | Spring Plate Hub | Threaded Puck |
| 20 | 105-80S | 40 | 40 | 40 | 8 | 1 | 1 | 16 | 8 | 8 | 8 | 1 | 24 | 8 | 1 | 1 | 40 | 4 | 2 | 1 | 1 | 1 | 8 |
| | 40 | 44 | 44 | 44 | 8 | 1 | 1 | 16 | 8 | 8 | 8 | 1 | 24 | 8 | 1 | 1 | 44 | 4 | 2 | 1 | 1 | 1 | 8 |
| | 60 | 43 | 43 | 43 | 8 | 1 | 1 | 16 | 8 | 8 | 8 | 1 | 24 | 8 | 1 | 1 | 43 | 4 | 2 | 1 | 1 | 1 | 8 |
| | 80 | 42 | 42 | 42 | 8 | 1 | 1 | 16 | 8 | 8 | 8 | 1 | 24 | 8 | 1 | 1 | 42 | 4 | 2 | 1 | 1 | 1 | 8 |
| | 100 | 41 | 41 | 41 | 8 | 1 | 1 | 16 | 8 | 8 | 8 | 1 | 24 | 8 | 1 | 1 | 41 | 4 | 2 | 1 | 1 | 1 | 8 |
| | 120 | 40 | 40 | 40 | 8 | 1 | 1 | 16 | 8 | 8 | 8 | 1 | 24 | 8 | 1 | 1 | 40 | 4 | 2 | 1 | 1 | 1 | 8 |
| | 140 | 38 | 38 | 38 | 8 | 1 | 1 | 16 | 8 | 8 | 8 | 1 | 24 | 8 | 1 | 1 | 38 | 4 | 2 | 1 | 1 | 1 | 8 |
| 24 | 105-80S | 48 | 48 | 48 | 8 | 1 | 1 | 16 | 8 | 8 | 8 | 1 | 24 | 8 | 1 | 1 | 48 | 4 | 2 | 1 | 1 | 1 | 8 |
| | 30 | 55 | 55 | 55 | 8 | 1 | 1 | 16 | 8 | 8 | 8 | 1 | 24 | 8 | 1 | 1 | 55 | 4 | 2 | 1 | 1 | 1 | 8 |
| | 40 | 54 | 54 | 54 | 8 | 1 | 1 | 16 | 8 | 8 | 8 | 1 | 24 | 8 | 1 | 1 | 54 | 4 | 2 | 1 | 1 | 1 | 8 |
| | 60 | 53 | 53 | 53 | 8 | 1 | 1 | 16 | 8 | 8 | 8 | 1 | 24 | 8 | 1 | 1 | 53 | 4 | 2 | 1 | 1 | 1 | 8 |
| | 80 | 52 | 52 | 52 | 8 | 1 | 1 | 16 | 8 | 8 | 8 | 1 | 24 | 8 | 1 | 1 | 52 | 4 | 2 | 1 | 1 | 1 | 8 |
| | 100 | 50 | 50 | 50 | 8 | 1 | 1 | 16 | 8 | 8 | 8 | 1 | 24 | 8 | 1 | 1 | 50 | 4 | 2 | 1 | 1 | 1 | 8 |
| | 120 | 48 | 48 | 48 | 8 | 1 | 1 | 16 | 8 | 8 | 8 | 1 | 24 | 8 | 1 | 1 | 48 | 4 | 2 | 1 | 1 | 1 | 8 |
| | 140 | 47 | 47 | 47 | 8 | 1 | 1 | 16 | 8 | 8 | 8 | 1 | 24 | 8 | 1 | 1 | 47 | 4 | 2 | 1 | 1 | 1 | 8 |
| 160 | 46 | 46 | 46 | 8 | 1 | 1 | 16 | 8 | 8 | 8 | 1 | 24 | 8 | 1 | 1 | 46 | 4 | 2 | 1 | 1 | 1 | 8 | |

4. Specifications

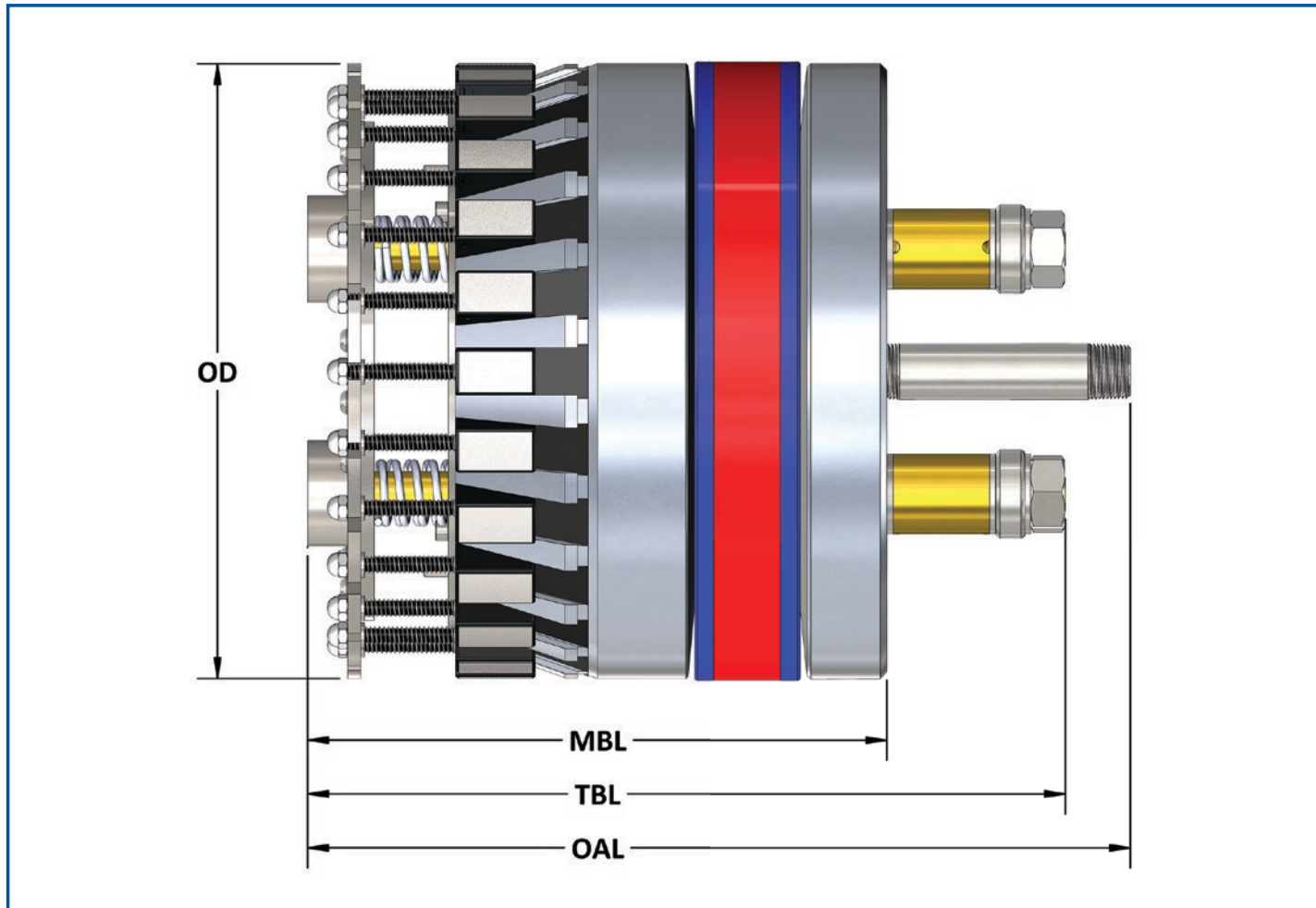


Figure 2: GripSafe IIB Dimensions Diagram

Table 2: GripSafe IIB 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) | Back Pressure Vent Thread | Test Pressure Rating (PSI)* |
|------------------------|-----------------|-----------------|--------------------|---------------------|--------------------------------|---------------------------|------------------|-----------------------|--------|--------------------------------|---------------------------|-----------------------------|
| | | | | | | | | Norm | Max. | | | |
| 4 | 10,10S | GS-I-R-0400-010 | 4.04 | 4.102 - 4.540 | 0.220 | 21 | 13.94 | 120 | 250 | 1-5/16" | 1/4" FNPT | 4875 |
| | 40,STD,40S | GS-I-R-0400-040 | 3.81 | 3.868 - 4.306 | 0.220 | 19 | 13.94 | 120 | 250 | 1-5/16" | 1/4" FNPT | 5450 |
| | 80,XS,80S | GS-I-R-0400-080 | 3.61 | 3.668 - 4.106 | 0.220 | 17 | 13.94 | 120 | 250 | 1-5/16" | 1/4" FNPT | 6050 |
| 6 | 10,10S | GS-I-R-0600-010 | 5.98 | 6.044 - 6.422 | 0.375 | 34 | 16.42 | 85 | 130 | 1-1/16" | 1/4" MNPT | 3300 |
| | 40,STD,40S | GS-I-R-0600-040 | 5.69 | 5.752 - 6.129 | 0.375 | 32 | 16.42 | 75 | 110 | 1-1/16" | 1/4" MNPT | 3600 |
| | 80,XS,80S | GS-I-R-0600-080 | 5.39 | 5.448 - 5.823 | 0.375 | 29 | 16.42 | 60 | 95 | 1-1/16" | 1/4" MNPT | 4000 |
| | 120 | GS-I-R-0600-120 | 5.13 | 5.188 - 5.562 | 0.375 | 27 | 16.42 | 55 | 80 | 1-1/16" | 1/4" MNPT | 3900 |
| | 160 | GS-I-R-0600-160 | 4.81 | 4.874 - 5.246 | 0.375 | 25 | 16.42 | 40 | 60 | 3/4" | 1/4" MNPT | 3850 |
| | XXH | GS-I-R-0600-XXH | 4.52 | 4.584 - 4.955 | 0.375 | 23 | 16.42 | 35 | 55 | 3/4" | 1/4" MNPT | 3700 |
| 8 | 10,10S | GS-I-R-0800-010 | 7.95 | 8.016 - 8.404 | 0.375 | 61 | 16.28 | 120 | 150 | 1-1/4" | 1/2" MNPT | 3200 |
| | 20 | GS-I-R-0800-020 | 7.75 | 7.812 - 8.199 | 0.375 | 59 | 16.28 | 120 | 150 | 1-1/4" | 1/2" MNPT | 3350 |
| | 30 | GS-I-R-0800-030 | 7.70 | 7.758 - 8.145 | 0.375 | 58 | 16.28 | 120 | 150 | 1-1/4" | 1/2" MNPT | 3400 |
| | 40,STD,40S | GS-I-R-0800-040 | 7.61 | 7.668 - 8.054 | 0.375 | 56 | 16.28 | 120 | 150 | 1-1/4" | 1/2" MNPT | 3475 |
| | 60 | GS-I-R-0800-060 | 7.44 | 7.500 - 7.885 | 0.375 | 55 | 16.28 | 120 | 150 | 1-1/4" | 1/2" MNPT | 3625 |
| | 80,XS,80S | GS-I-R-0800-080 | 7.25 | 7.312 - 7.696 | 0.375 | 53 | 16.28 | 120 | 150 | 1-1/4" | 1/2" MNPT | 3800 |
| | 100 | GS-I-R-0800-100 | 7.06 | 7.124 - 7.507 | 0.375 | 50 | 16.28 | 100 | 150 | 1-1/4" | 1/2" MNPT | 3725 |
| | 120 | GS-I-R-0800-120 | 6.81 | 6.874 - 7.256 | 0.375 | 48 | 16.28 | 100 | 150 | 1-1/4" | 1/2" MNPT | 3725 |
| | 140 | GS-I-R-0800-140 | 6.63 | 6.688 - 7.069 | 0.375 | 46 | 16.28 | 90 | 150 | 1-1/16" | 1/4" MNPT | 3925 |
| | 160 | GS-I-R-0800-160 | 6.44 | 6.500 - 6.880 | 0.375 | 44 | 16.28 | 90 | 150 | 1-1/16" | 1/4" MNPT | 3825 |
| 10 | XXH | GS-I-R-0800-XXH | 6.50 | 6.562 - 6.943 | 0.375 | 44 | 16.28 | 90 | 150 | 1-1/16" | 1/4" MNPT | 3750 |
| | 10,10S | GS-I-R-1000-010 | 10.05 | 10.107 - 10.505 | 0.375 | 83 | 15.40 | 120 | 150 | 1-1/4" | 3/4" MNPT | 2725 |
| | 20 | GS-I-R-1000-020 | 9.88 | 9.937 - 10.335 | 0.375 | 80 | 15.40 | 120 | 150 | 1-1/4" | 3/4" MNPT | 2800 |
| | 30 | GS-I-R-1000-030 | 9.76 | 9.823 - 10.220 | 0.375 | 79 | 15.40 | 120 | 150 | 1-1/4" | 3/4" MNPT | 2875 |
| | 40,STD,40S | GS-I-R-1000-040 | 9.65 | 9.707 - 10.103 | 0.375 | 76 | 15.40 | 120 | 150 | 1-1/4" | 3/4" MNPT | 2950 |
| | 60,XS,80S | GS-I-R-1000-08S | 9.38 | 9.437 - 9.832 | 0.375 | 73 | 15.40 | 120 | 150 | 1-1/4" | 3/4" MNPT | 3100 |
| | 80 | GS-I-R-1000-080 | 9.19 | 9.249 - 9.643 | 0.375 | 71 | 15.40 | 120 | 150 | 1-1/4" | 3/4" MNPT | 3225 |
| | 100 | GS-I-R-1000-100 | 8.94 | 8.999 - 9.392 | 0.375 | 67 | 15.40 | 120 | 150 | 1-1/4" | 3/4" MNPT | 3400 |
| | 120 | GS-I-R-1000-120 | 8.69 | 8.749 - 9.141 | 0.375 | 65 | 15.40 | 120 | 150 | 1-1/4" | 1/2" MNPT | 3425 |
| | 140,XXH | GS-I-R-1000-140 | 8.38 | 8.437 - 8.827 | 0.375 | 63 | 15.40 | 120 | 150 | 1-1/4" | 1/2" MNPT | 3475 |
| 12 | 160 | GS-I-R-1000-160 | 8.13 | 8.187 - 8.576 | 0.375 | 62 | 15.40 | 120 | 150 | 1-1/4" | 1/2" MNPT | 3475 |
| | 10,10S | GS-I-R-1200-010 | 12.02 | 12.077 - 12.485 | 0.375 | 109 | 15.40 | 120 | 150 | 1-1/4" | 3/4" MNPT | 2300 |
| | 20 | GS-I-R-1200-020 | 11.88 | 11.937 - 12.345 | 0.375 | 107 | 15.40 | 120 | 150 | 1-1/4" | 3/4" MNPT | 2375 |
| | 30 | GS-I-R-1200-030 | 11.72 | 11.777 - 12.184 | 0.375 | 105 | 15.40 | 120 | 150 | 1-1/4" | 3/4" MNPT | 2425 |
| | STD,40S | GS-I-R-1200-04S | 11.63 | 11.687 - 12.093 | 0.375 | 102 | 15.40 | 120 | 150 | 1-1/4" | 3/4" MNPT | 2475 |
| | 40 | GS-I-R-1200-040 | 11.56 | 11.625 - 12.031 | 0.375 | 101 | 15.40 | 120 | 150 | 1-1/4" | 3/4" MNPT | 2500 |
| | XS,80S | GS-I-R-1200-08S | 11.38 | 11.437 - 11.842 | 0.375 | 100 | 15.40 | 120 | 150 | 1-1/4" | 3/4" MNPT | 2575 |
| | 60 | GS-I-R-1200-060 | 11.25 | 11.313 - 11.717 | 0.375 | 97 | 15.40 | 120 | 150 | 1-1/4" | 3/4" MNPT | 2725 |
| | 80 | GS-I-R-1200-080 | 11.00 | 11.061 - 11.464 | 0.375 | 93 | 15.40 | 120 | 150 | 1-1/4" | 3/4" MNPT | 2850 |
| | 100 | GS-I-R-1200-100 | 10.69 | 10.749 - 11.151 | 0.375 | 89 | 15.40 | 120 | 150 | 1-1/4" | 3/4" MNPT | 2900 |
| 14 | 120,XXH | GS-I-R-1200-120 | 10.38 | 10.437 - 10.837 | 0.375 | 87 | 15.40 | 120 | 150 | 1-1/4" | 3/4" MNPT | 2950 |
| | 140 | GS-I-R-1200-140 | 10.13 | 10.187 - 10.586 | 0.375 | 85 | 15.40 | 120 | 150 | 1-1/4" | 3/4" MNPT | 2950 |
| | 160 | GS-I-R-1200-160 | 9.75 | 9.813 - 10.210 | 0.375 | 81 | 15.40 | 120 | 150 | 1-1/4" | 3/4" MNPT | 3025 |
| | 10S | GS-I-R-1400-01S | 13.25 | 13.311 - 13.725 | 0.375 | 146 | 16.50 | 120 | 300 | 1-5/8" | 1" MNPT | 1925 |
| | 10 | GS-I-R-1400-010 | 13.13 | 13.187 - 13.601 | 0.375 | 144 | 16.50 | 120 | 300 | 1-5/8" | 1" MNPT | 1950 |
| | 20 | GS-I-R-1400-020 | 13.00 | 13.063 - 13.476 | 0.375 | 142 | 16.50 | 120 | 300 | 1-5/8" | 1" MNPT | 1975 |
| 14 | 30,STD,40S | GS-I-R-1400-04S | 12.88 | 12.937 - 13.333 | 0.375 | 138 | 16.50 | 120 | 300 | 1-5/8" | 1" MNPT | 2025 |
| | 40 | GS-I-R-1400-040 | 12.75 | 12.811 - 13.223 | 0.375 | 137 | 16.50 | 120 | 250 | 1-5/8" | 1" MNPT | 2050 |
| | XS,80S | GS-I-R-1400-08S | 12.63 | 12.687 - 13.098 | 0.375 | 136 | 16.50 | 120 | 250 | 1-5/8" | 1" MNPT | 2100 |
| | 60 | GS-I-R-1400-060 | 12.44 | 12.499 - 12.909 | 0.375 | 131 | 16.50 | 120 | 250 | 1-5/8" | 1" MNPT | 2425 |
| | 80 | GS-I-R-1400-080 | 12.13 | 12.187 - 12.596 | 0.375 | 125 | 16.50 | 120 | 250 | 1-5/8" | 1" MNPT | 2550 |
| | 100 | GS-I-R-1400-100 | 11.75 | 11.811 - 12.218 | 0.375 | 119 | 16.50 | 120 | 250 | 1-5/8" | 1" MNPT | 2725 |
| | 120 | GS-I-R-1400-120 | 11.44 | 11.499 - 11.904 | 0.375 | 113 | 16.50 | 120 | 250 | 1-5/8" | 1" MNPT | 2750 |
| | 140 | GS-I-R-1400-140 | 11.13 | 11.187 - 11.591 | 0.375 | 108 | 16.50 | 120 | 250 | 1-5/8" | 1" MNPT | 2800 |
| 160 | GS-I-R-1400-160 | 10.81 | 10.875 - 11.277 | 0.375 | 103 | 16.50 | 120 | 250 | 1-5/8" | 1" MNPT | 2825 | |

• Larger sizes and custom configurations available upon request. Smaller sizes release date pending.

* NPS 6-24 TOOL OD MUST BE WITHIN 1/8" CONCENTRICITY TO THE PIPE ID.

• 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 IIB Specifications Continued

| 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) | Back Pressure Vent Thread | Test Pressure Rating (PSI)* |
|------------------------|-----------------|-----------------|--------------------|---------------------|--------------------------------|---------------------------|------------------|-----------------------|--------|--------------------------------|---------------------------|-----------------------------|
| | | | | | | | | Norm | Max. | | | |
| 16 | 10S | GS-I-R-1600-01S | 15.25 | 15.311 - 15.735 | 0.375 | 190 | 16.50 | 120 | 300 | 1-5/8" | 1" MNPT | 1950 |
| | 10 | GS-I-R-1600-010 | 15.13 | 15.187 - 15.611 | 0.375 | 187 | 16.50 | 120 | 300 | 1-5/8" | 1" MNPT | 1975 |
| | 20 | GS-I-R-1600-020 | 15.00 | 15.063 - 15.486 | 0.375 | 184 | 16.50 | 120 | 300 | 1-5/8" | 1" MNPT | 2000 |
| | 30,STD,40S | GS-I-R-1600-04S | 14.88 | 14.937 - 15.360 | 0.375 | 181 | 16.50 | 120 | 300 | 1-5/8" | 1" MNPT | 2025 |
| | 40,XS,80S | GS-I-R-1600-08S | 14.63 | 14.687 - 15.108 | 0.375 | 176 | 16.50 | 120 | 300 | 1-5/8" | 1" MNPT | 2100 |
| | 60 | GS-I-R-1600-060 | 14.31 | 14.375 - 14.795 | 0.375 | 169 | 16.50 | 120 | 300 | 1-5/8" | 1" MNPT | 2200 |
| | 80 | GS-I-R-1600-080 | 14.00 | 14.063 - 14.481 | 0.375 | 162 | 16.50 | 120 | 300 | 1-5/8" | 1" MNPT | 2300 |
| | 100 | GS-I-R-1600-100 | 13.56 | 13.625 - 14.041 | 0.375 | 153 | 16.50 | 120 | 300 | 1-5/8" | 1" MNPT | 2350 |
| | 120 | GS-I-R-1600-120 | 13.19 | 13.249 - 13.663 | 0.375 | 148 | 16.50 | 120 | 275 | 1-5/8" | 1" MNPT | 2400 |
| | 140 | GS-I-R-1600-140 | 12.75 | 12.811 - 13.223 | 0.375 | 140 | 16.50 | 120 | 275 | 1-5/8" | 1" MNPT | 2500 |
| 160 | GS-I-R-1600-160 | 12.44 | 12.499 - 12.909 | 0.375 | 135 | 16.50 | 120 | 275 | 1-5/8" | 1" MNPT | 2525 | |
| 18 | 10S | GS-I-R-1800-01S | 17.25 | 17.311 - 17.745 | 0.375 | 229 | 16.50 | 120 | 350 | 1-5/8" | 1" MNPT | 1725 |
| | 10 | GS-I-R-1800-010 | 17.13 | 17.187 - 17.621 | 0.375 | 225 | 16.50 | 120 | 350 | 1-5/8" | 1" MNPT | 1750 |
| | 20 | GS-I-R-1800-020 | 17.00 | 17.063 - 17.496 | 0.375 | 222 | 16.50 | 120 | 350 | 1-5/8" | 1" MNPT | 1775 |
| | STD,40S | GS-I-R-1800-04S | 16.88 | 16.937 - 17.370 | 0.375 | 219 | 16.50 | 120 | 350 | 1-5/8" | 1" MNPT | 1800 |
| | 30 | GS-I-R-1800-030 | 16.75 | 16.811 - 17.243 | 0.375 | 216 | 16.50 | 120 | 350 | 1-5/8" | 1" MNPT | 1825 |
| | XS,80S | GS-I-R-1800-08S | 16.63 | 16.687 - 17.118 | 0.375 | 214 | 16.50 | 120 | 350 | 1-5/8" | 1" MNPT | 1850 |
| | 40 | GS-I-R-1800-040 | 16.50 | 16.563 - 16.994 | 0.375 | 211 | 16.50 | 120 | 350 | 1-5/8" | 1" MNPT | 1975 |
| | 60 | GS-I-R-1800-060 | 16.25 | 16.311 - 16.740 | 0.375 | 205 | 16.50 | 120 | 350 | 1-5/8" | 1" MNPT | 2025 |
| | 80 | GS-I-R-1800-080 | 15.75 | 15.811 - 16.238 | 0.375 | 199 | 16.50 | 120 | 350 | 1-5/8" | 1" MNPT | 2100 |
| | 100 | GS-I-R-1800-100 | 15.31 | 15.375 - 15.800 | 0.375 | 194 | 16.50 | 120 | 350 | 1-5/8" | 1" MNPT | 2175 |
| | 120 | GS-I-R-1800-120 | 15.08 | 15.137 - 15.561 | 0.375 | 189 | 16.50 | 120 | 350 | 1-5/8" | 1" MNPT | 2175 |
| | 140 | GS-I-R-1800-140 | 14.50 | 14.563 - 14.984 | 0.375 | 181 | 16.50 | 120 | 350 | 1-5/8" | 1" MNPT | 2275 |
| 160 | GS-I-R-1800-160 | 14.06 | 14.125 - 14.543 | 0.375 | 172 | 16.50 | 120 | 350 | 1-5/8" | 1" MNPT | 2350 | |
| 20 | 10S | GS-I-R-2000-01S | 19.19 | 19.249 - 19.693 | 0.375 | 286 | 16.70 | 120 | 350 | 1-5/8" | 1-1/2" MNPT | 1550 |
| | 10 | GS-I-R-2000-010 | 19.13 | 19.187 - 19.631 | 0.375 | 284 | 16.70 | 120 | 350 | 1-5/8" | 1-1/2" MNPT | 1550 |
| | 20,STD,40S | GS-I-R-2000-04S | 18.88 | 18.937 - 19.380 | 0.375 | 278 | 16.70 | 120 | 350 | 1-5/8" | 1-1/2" MNPT | 1600 |
| | 30,XS,80S | GS-I-R-2000-08S | 18.63 | 18.687 - 19.128 | 0.375 | 271 | 16.70 | 120 | 350 | 1-5/8" | 1-1/2" MNPT | 1650 |
| | 40 | GS-I-R-2000-040 | 18.44 | 18.499 - 18.939 | 0.375 | 266 | 16.70 | 120 | 350 | 1-5/8" | 1-1/2" MNPT | 1850 |
| | 60 | GS-I-R-2000-060 | 18.00 | 18.063 - 18.501 | 0.375 | 254 | 16.70 | 120 | 350 | 1-5/8" | 1-1/2" MNPT | 1875 |
| | 80 | GS-I-R-2000-080 | 17.56 | 17.625 - 18.061 | 0.375 | 243 | 16.70 | 120 | 350 | 1-5/8" | 1-1/2" MNPT | 1925 |
| | 100 | GS-I-R-2000-100 | 17.06 | 17.125 - 17.558 | 0.375 | 231 | 16.70 | 120 | 350 | 1-5/8" | 1-1/2" MNPT | 2000 |
| | 120 | GS-I-R-2000-120 | 16.63 | 16.687 - 17.118 | 0.375 | 236 | 16.70 | 120 | 350 | 1-5/8" | 1-1/2" MNPT | 2050 |
| | 140 | GS-I-R-2000-140 | 16.12 | 16.183 - 16.612 | 0.375 | 223 | 16.70 | 120 | 320 | 1-5/8" | 1-1/2" MNPT | 2075 |
| 160 | GS-I-R-2000-160 | 15.69 | 15.751 - 16.178 | 0.375 | 212 | 16.70 | 120 | 320 | 1-5/8" | 1-1/2" MNPT | 2125 | |
| 24 | 10,10S | GS-I-R-2400-010 | 23.13 | 23.187 - 23.651 | 0.375 | 390 | 16.70 | 120 | 350 | 1-5/8" | 1-1/2" MNPT | 1300 |
| | 20,STD,40S | GS-I-R-2400-04S | 22.88 | 22.937 - 23.400 | 0.375 | 381 | 16.70 | 120 | 350 | 1-5/8" | 1-1/2" MNPT | 1325 |
| | XS,80S | GS-I-R-2400-08S | 22.63 | 22.687 - 23.148 | 0.375 | 375 | 16.70 | 120 | 350 | 1-5/8" | 1-1/2" MNPT | 1350 |
| | 30 | GS-I-R-2400-030 | 22.50 | 22.563 - 23.024 | 0.375 | 370 | 16.70 | 120 | 350 | 1-5/8" | 1-1/2" MNPT | 1550 |
| | 40 | GS-I-R-2400-040 | 22.25 | 22.311 - 22.770 | 0.375 | 363 | 16.70 | 120 | 350 | 1-5/8" | 1-1/2" MNPT | 1575 |
| | 60 | GS-I-R-2400-060 | 21.69 | 21.749 - 22.206 | 0.375 | 346 | 16.70 | 120 | 350 | 1-5/8" | 1-1/2" MNPT | 1625 |
| | 80 | GS-I-R-2400-080 | 21.19 | 21.249 - 21.703 | 0.375 | 357 | 16.70 | 120 | 350 | 1-5/8" | 1-1/2" MNPT | 1650 |
| | 100 | GS-I-R-2400-100 | 20.56 | 20.625 - 21.076 | 0.375 | 346 | 16.70 | 120 | 350 | 1-5/8" | 1-1/2" MNPT | 1700 |
| | 120 | GS-I-R-2400-120 | 20.00 | 20.063 - 20.511 | 0.375 | 336 | 16.70 | 120 | 350 | 1-5/8" | 1-1/2" MNPT | 1725 |
| | 140 | GS-I-R-2400-140 | 19.50 | 19.563 - 20.009 | 0.375 | 328 | 16.70 | 120 | 350 | 1-5/8" | 1-1/2" MNPT | 1750 |
| 160 | GS-I-R-2400-160 | 18.94 | 18.999 - 19.442 | 0.375 | 318 | 16.70 | 120 | 350 | 1-5/8" | 1-1/2" MNPT | 1825 | |

• Larger sizes and custom configurations available upon request. Smaller sizes release date pending.

* NPS 6-24 TOOL OD MUST BE WITHIN 1/8" CONCENTRICITY TO THE PIPE ID.

• 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 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 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 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.

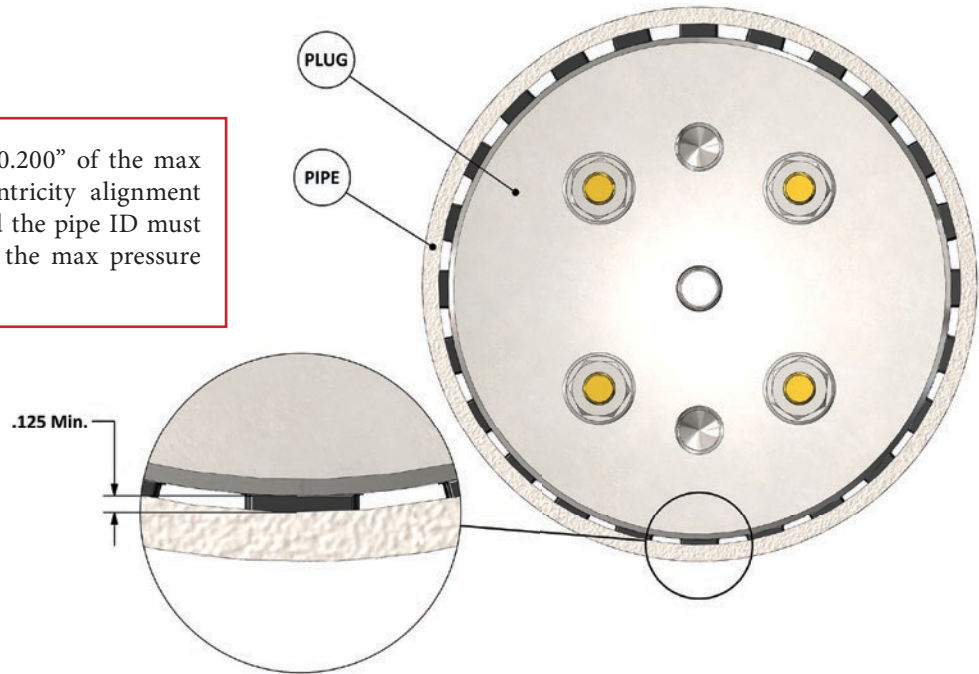


Figure 3: GripSafe Plug and Pipe Concentricity

5. Preparing the GripSafe IIB Plug for Installation

5.1 The GripSafe IIB should be in the “Ready to Install” position from the factory.

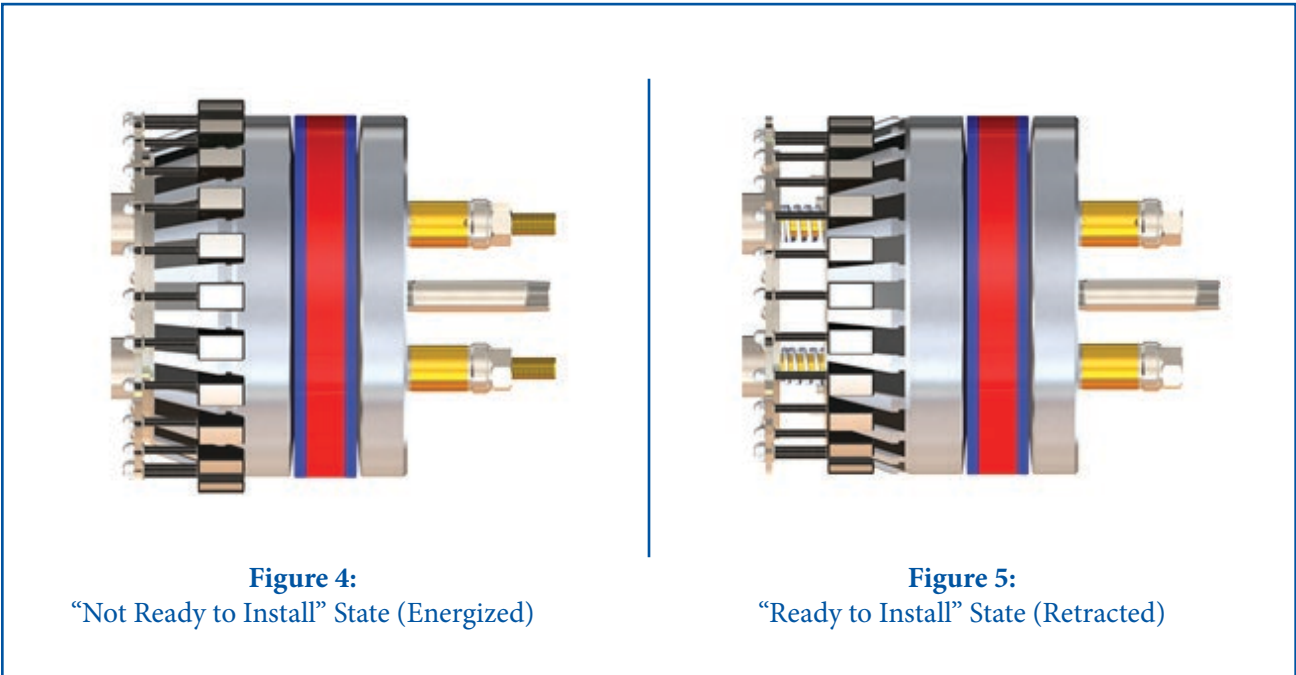


Figure 4:
“Not Ready to Install” State (Energized)

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


- Ensure the *Compression Hex Nuts(10)* are not tightened and the *Spring Plate Hub(21)* is in the retracted state (see **Figure 5**).
- In the “Not Ready to Install” state (see **Figure 4**), the *GripSafe plug’s Wedge Grippers(3)*, will obstruct insertion into the pipe.
- In the “Ready to Install” state (see **Figure 5**) the GripSafe plug will not immediately grip the pipe upon insertion.
- If the plug is being used for pressure testing, make sure the *Vent Port(11)* is tightened and a cap is installed before installing the plug into the pipe or fitting.



CAUTION: Make sure plug is clean of debris and contaminants. Each *Wedge Gripper(3)* should slide freely up and down in its slot with a full range of motion and no resistance. *Wedge Grippers(3)* with impeded movement due to debris, dirt or contaminants will cause the plug to not grip on the pipe’s ID which can cause it to eject under pressure, potentially leading to injury or death, material loss, and/or equipment damage.

6. Installing the GripSafe IIB Plug



CAUTION: Ensure pipe I.D. is clean, and loose debris is removed to the deepest point the plug will be installed into. If the pipe is lined or has an irremovable product,  and **contact USA Industries, Inc. for support before proceeding**. Failure to do so may impede the wedges ability to grip and cause the plug to eject under pressure. Be sure to wear proper PPE and follow all site guidelines.

6.1 Insert the GripSafe IIB plug evenly into the pipe.

- See *Table 2* for Operational ID Range and clearance requirements.
- For using GripSafe *Lifting Device*, see **Section 8**.
- Insert the GripSafe plug into the pipe, *Spring Plate(21)* side first (see **Figure 6**).
- When testing a Weld Neck Flange weld, the *Bottom Plate(14)* must be inserted past the weld droop and the end of the *Vent Port(11)* must be at least 1” away from the face of the Weld Neck Flange (see **Figure 6**).



Figure 6: GripSafe IIB Minimum Insertion Depth in a Sectioned Pipe

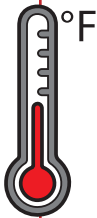


CAUTION: The GripSafe IIB plug is designed to hold pressure originating from the installation side only. If pressure is anticipated on the other side of the plug, **contact USA Industries for possible solutions** (see **Figure 8**). Disregarding this caution may result in the GripSafe plug ejecting, which could lead to injury, material loss, and/or equipment damage.



CAUTION: In the “Ready to Install” state, it is important to note the plug will not be immediately gripping the pipe upon insertion. Only after tightening the *Compression Hex Nuts(10)* while plug is in the pipe, to advance the bottom of the *Spring Plate(12)* to contact the *Retainer Plate(20)*, will the plug be securely gripping the pipe. Continue installation with **Step 6.2**.

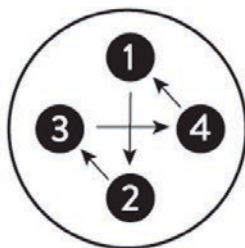
TEMPERATURE NOTE:



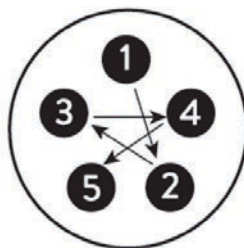
If welding is to occur on the pipe while the plug is installed the front face of the plug *Vent Port(11)* should be installed a minimum of 6” from the center of an active weld to prevent the *Seals (Tri-Ply™)(15)* from degrading or ultimately failing due to melting. For post weld heat treats, bake-outs, etc., the plug 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. In all cases, monitor the pressure behind the plug and/or between the seals at all times and stop work immediately if any pressure drop is detected. In addition, the pipes external surface temperature should be monitored corresponding to the plugs seal location at all times to ensure damage to the seals does not occur.

6.2 Evenly tighten the Compression Hex Nuts(10).

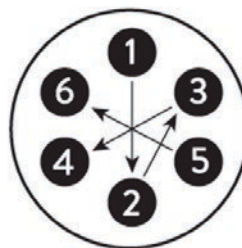
- Using a star pattern (see **Figure 7**), turn each *Compression Hex Nut(10)* a maximum of 3 full revolutions before moving to the next nut. Repeat until 50% target torque is achieved on all nuts, and then increase to 100% target installation torque and continue torquing in a star pattern. After completing the star pattern at 100% of the target torque, use a circular pattern to confirm all nuts are torqued correctly.



4 Compression Hex Nut Tightening Pattern



5 Compression Hex Nut Tightening Pattern



6 Compression Hex Nut Tightening Pattern



8 Compression Hex Nut Tightening Pattern

- Minimal torque will be required for the first several passes, but torque will increase notably after the *Seal(15)* begins to compress against the pipe ID.

6.3. Install Gasket and IIB Blind Flange

- Use in-house procedures to install the appropriate gasket and IIB Blind Flange for the application.
- Follow gasket manufacturer’s torque and installation procedure or use an approved in-house procedure.

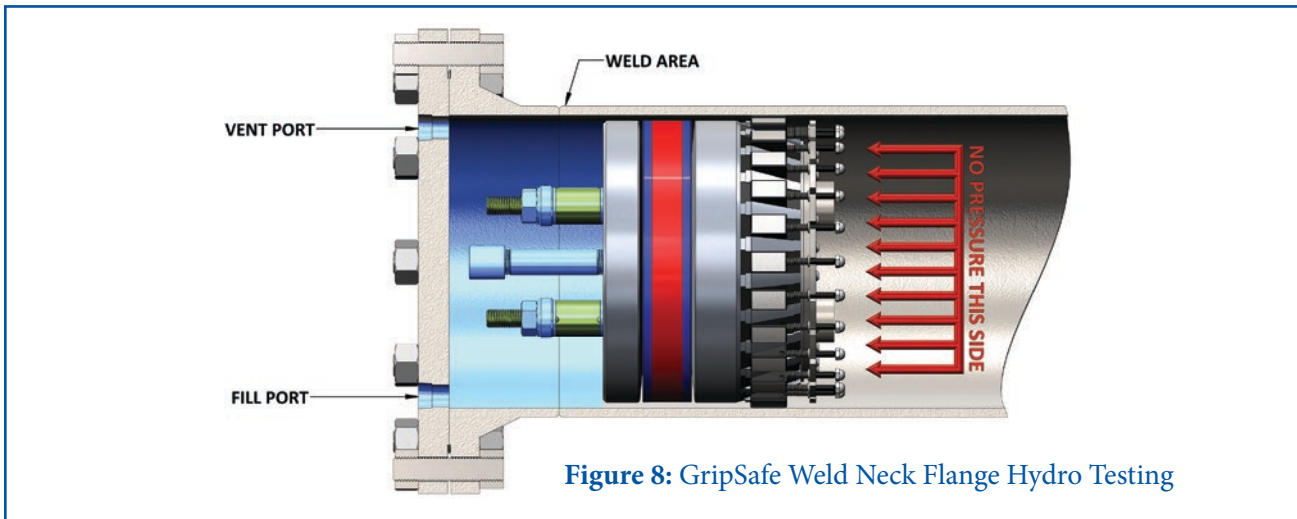


Figure 8: GripSafe Weld Neck Flange Hydro Testing

6.4. Pressurize system through the *Flange Ports*, and verify the integrity of the *Seal(15)*.

- Attach the hydro pump's hose to the *NPT Fill Port* of the Blind Flange.
- Bleed off air by pumping water into the system while keeping the NPT Vent Port Open.
- Once air has been purged, plug the NPT Vent Port.
- Increase pressure to 25% of target pressure or 150 psig, whichever is less. A drop in pressure may not be an indication of leakage. *GripSafe Seals(15)* 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 *Seal(15)* 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.



CAUTION: Carefully observe the location of the pipe where the *Wedge Grippers(3)* make contact while performing a hydro test. 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.**



CAUTION: If at any time during hydro testing a popping or clicking sound is heard, **STOP IMMEDIATELY** and slowly release the pressure from the system. Popping or clicking sounds during hydro testing may be a sign of the *Wedge Gripper(3)* slipping, cracking, or one of the plug components failing. Remove the plug from the pipe or fitting and inspect for damage. **Contact USA Industries for further assistance.**



CAUTION: REFER TO TABLE 3: MAXIMUM ALLOWABLE PRESSURE in this manual; **DO NOT EXCEED** the pressure ratings identified in the table when pressurizing the pipe. Careful observation is needed at the location of the pipe where the *Wedge Grippers* make contact while performing a hydro test. 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.**

7. GripSafe IIB Plug Removal

- 7.1. Depressurize system using the pressure bleed-off valve on the hydro test pump equipment.
- 7.2. Remove the hydro pump's hose from the *NPT Fill Port* to bleed water out of the system.
- 7.3. Use in house procedures to remove the gasket and IIB Blind Flange from the system.



CAUTION: SLOWLY open *Vent Port(11)* to relieve any gas buildup or hazardous fluid at the back of the plug.

- 7.4. Loosen the *Compression Hex Nuts(10)* in an even star pattern as to not place the whole load on one bolt.
 - If a *Compression Hex Nut(10)* runs free during loosening, run the nut back to flush with the face of the *Bottom Compression Plate(14)*. The *Seal(15)* acts as a spring containing a large amount of force too great for one *All Threaded Shaft(8)* to handle.
 - After the *Seal(15)* has fully decompressed, the torque required will be notably less.
 - Once the *Seal(15)* has broken free from the pipe ID, continue loosening the *Compression Hex Nuts(10)* until they are even with the top of the *All Threaded Shaft(8)*.



NOTE: Do not remove the *Compression Hex Nut(10)* from the bolt. If this happens, immediately reinstall the components.



CAUTION: Ensure that all *Compression Hex Nuts(10)* maintain a load on them during the entire loosening process. Having all *Compression Hex Nuts(10)* loose, but one, means that a large load will be left on one *Compression Bolt* and the risk of breakage is likely. Once the *Seal(15)* has relaxed enough to break the seal from the pipe ID, the plug is now in a much more relaxed state and the *Compression Hex Nuts(10)* can be loosened in full.

- 7.5. Remove the GripSafe plug from the pipe.
 - Clean and store for later use or return to USA Industries, Inc.
 - Thoroughly dry and apply rust preventative oil to the *Thrust Bearing(9)* before storing.
 - Store out of direct sunlight in an area not exposed to above 150°F. UV. Excessive heat will cause *Seal(15)* degradation over time.
 - The *Wedge Gripper(3)* texture (*Gritlock™*) may become packed with pipe scale and rust after 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 packing is persistent, use of a household rust remover along with a stiff stainless steel bristled brush should be sufficient. Rinse plug clean of residual chemicals with tap water and dry thoroughly.

8. GripSafe Lifting Device

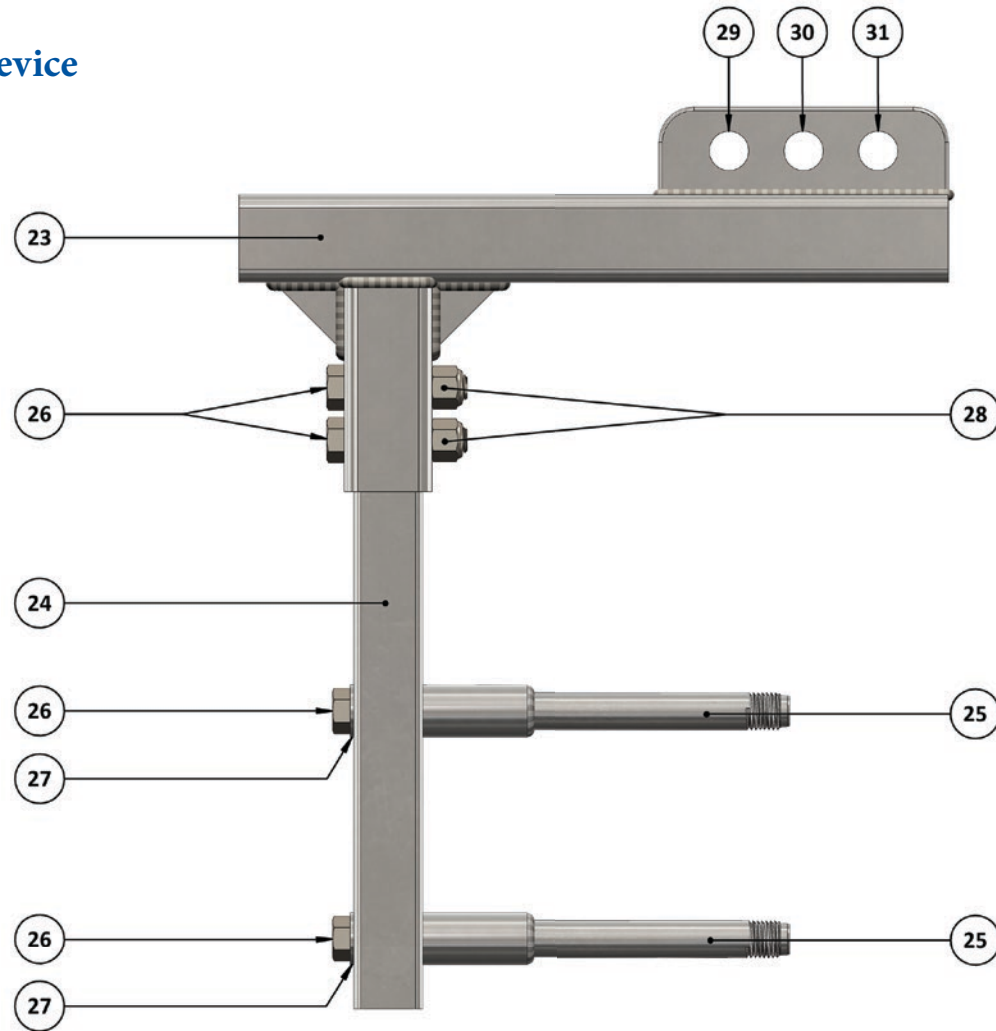




Table 4: Lifting Device Bill of Materials

| Plug Size | ②③ | ②④ | ②④ | ②④ | ②⑤ | ②⑤ | ②⑥ | ②⑦ | ②⑧ |
|-----------|-----------------------|-----------------------------------|-----------------------------------|-----------------------------------|---------------------|---------------------|---------------------|-----------------------|--------------------|
| | Universal Lifting Bar | Telescoping Lifting Attachment #1 | Telescoping Lifting Attachment #2 | Telescoping Lifting Attachment #3 | Lifting Standoff #1 | Lifting Standoff #2 | Lifting Device Bolt | Lifting Device Washer | Lifting Device Nut |
| 10 | 1 | 1 | N/A | N/A | 2 | N/A | 4 | 2 | 2 |
| 12 | 1 | 1 | N/A | N/A | 2 | N/A | 4 | 2 | 2 |
| 14 | 1 | N/A | 1 | N/A | N/A | 2 | 4 | 2 | 2 |
| 16 | 1 | N/A | 1 | N/A | N/A | 2 | 4 | 2 | 2 |
| 18 | 1 | N/A | 1 | N/A | N/A | 2 | 4 | 2 | 2 |
| 20 | 1 | N/A | N/A | 1 | N/A | 2 | 4 | 2 | 2 |
| 24 | 1 | N/A | N/A | 1 | N/A | 2 | 4 | 2 | 2 |
| 30 | 1 | N/A | N/A | N/A | N/A | 2 | 4 | 2 | 2 |
| 36 | 1 | N/A | N/A | N/A | N/A | 2 | 4 | 2 | 2 |

8.1 Installing the lifting device on the GripSafe IIB plug.

- Insert the *Lifting Standoffs(25)* into the two holes located on the face of the *Bottom Compression Plate(14)*. Hand tighten both *Lifting Standoffs(25)* until they bottom out (see **Figure 10**).



CAUTION: A minimum of 6 full turns is needed when threading both the *Lifting Standoffs(25)* into the GripSafe IIB plug. Failure to follow this step may cause the *Lifting Threads* to fail under the load of the plug, causing it to fall, injuring personnel and/or damage to equipment.



NOTE: There are two types of *Lifting Standoffs(25)*, #1 and #2. #1 is used for plugs 10”- 12” and #2 is used for plugs 14” and over.

- Line up the holes on the *Telescoping Lifting Attachment(24)* with the internally threaded holes on the *Lifting Standoffs(25)*. Fasten the *Telescoping Lifting Attachment(24)* on to the *LiftingStandoffs(25)* with the provided *Lifting Device Bolts(26)* and *Washers(27)* (see **Figure 11**).



NOTE: There are 3 types of *Telescoping Lifting Attachments(24)*, #1, #2, and #3. Each have different lengths and mounting hole locations to accommodate distinct plug sizes. Refer to Table 5 for details.

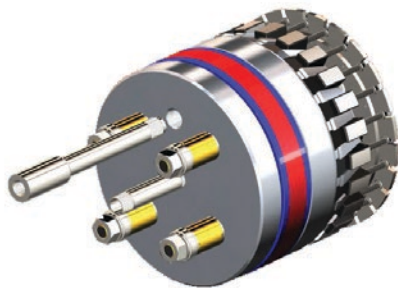


Figure 10: Inserting and Threading *Lifting Standoffs* into the Plug

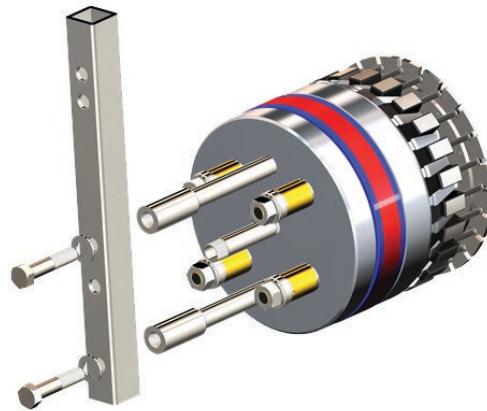
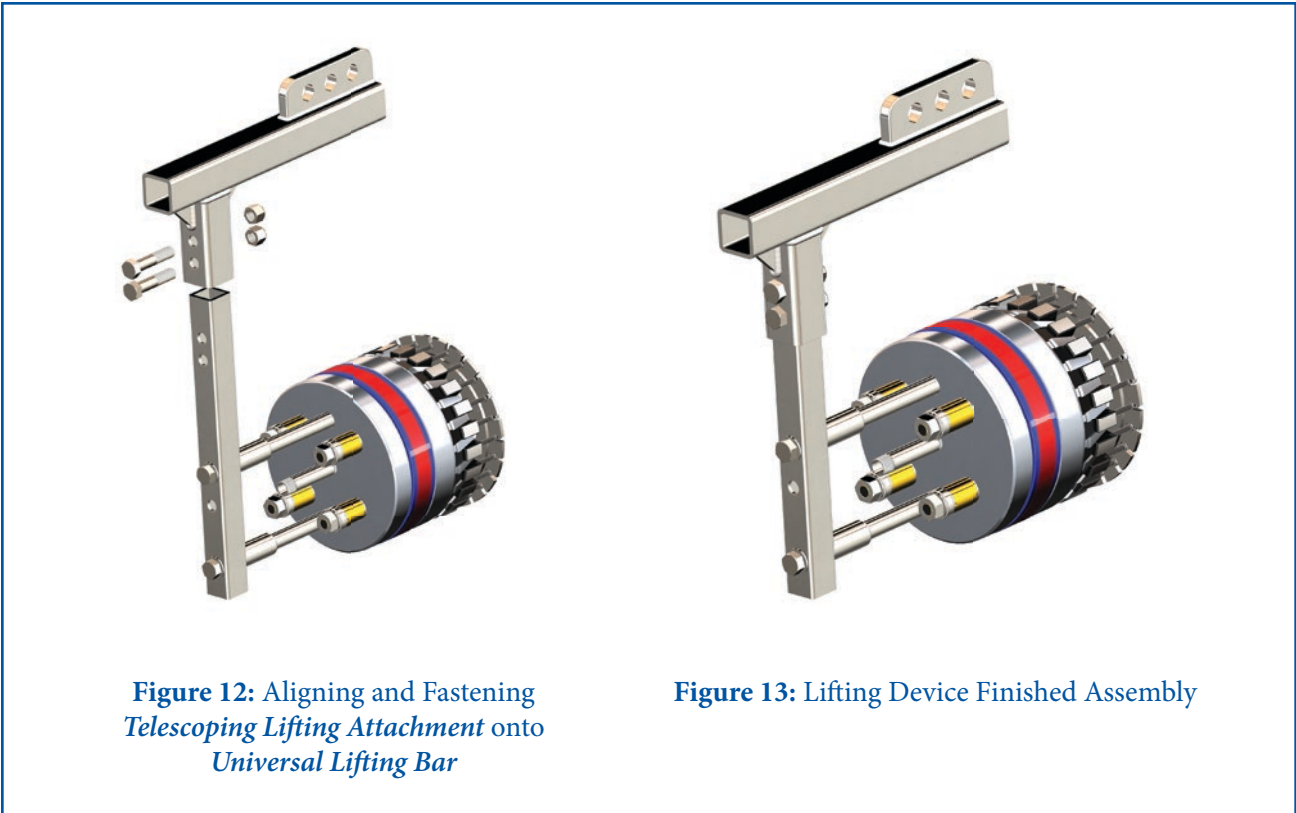


Figure 11: Aligning and Fastening *Telescoping Lifting Attachment* onto *Lifting Standoffs*

- After fastening the *Telescoping Lifting Attachment(24)* to the *Lifting Standoffs(25)* slide it into the *Universal Lifting Bar's(23)* shorter square tubing. Upon insertion, align the two holes on both the *Telescoping Lifting Attachment(24)* and the *Universal Lifting Bar(23)*.
- Fasten the *Telescoping Lifting Attachment(24)* with the provided *Lifting Bolts(26)* and *Nuts(28)* (see **Figure 12**).



8.2 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 IIB 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*(23) and used as leverage. A *Cheater Bar* can also be used to help manipulate the plug while inserting it into the pipe.



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