

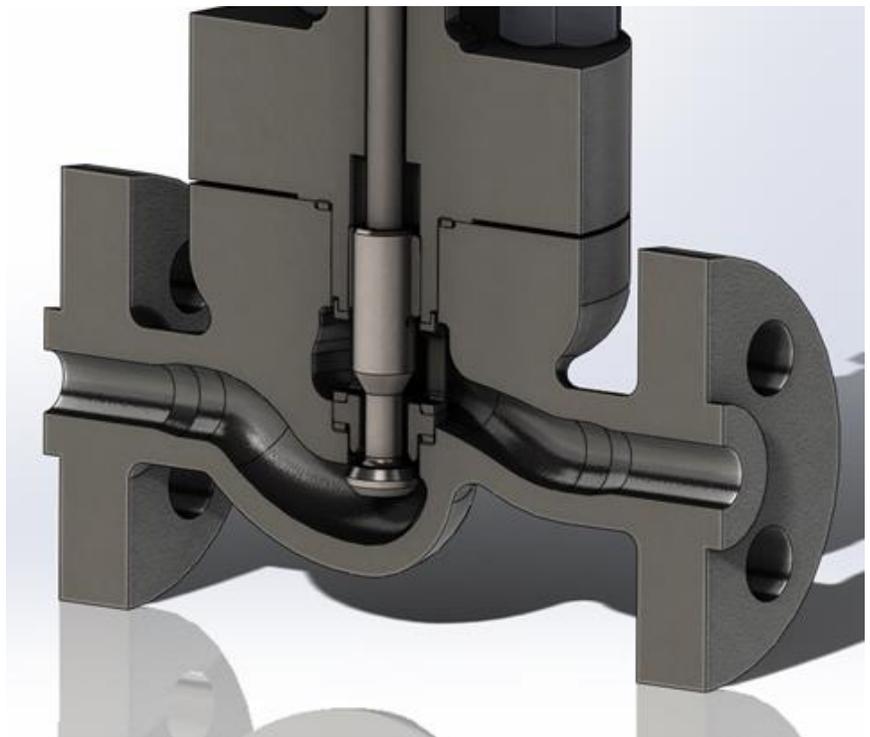
Masoneilan™

535H / 536H Series

Pressure Regulator

for Reducing, Back Pressure
and Differential Service

Instruction Manual (Rev.D)



THESE INSTRUCTIONS PROVIDE THE CUSTOMER/OPERATOR WITH IMPORTANT PROJECT-SPECIFIC REFERENCE INFORMATION IN ADDITION TO THE CUSTOMER/OPERATOR'S NORMAL OPERATION AND MAINTENANCE PROCEDURES. SINCE OPERATION AND MAINTENANCE PHILOSOPHIES VARY, BAKER HUGHES COMPANY (AND ITS SUBSIDIARIES AND AFFILIATES) DOES NOT ATTEMPT TO DICTATE SPECIFIC PROCEDURES, BUT TO PROVIDE BASIC LIMITATIONS AND REQUIREMENTS CREATED BY THE TYPE OF EQUIPMENT PROVIDED.

THESE INSTRUCTIONS ASSUME THAT OPERATORS ALREADY HAVE A GENERAL UNDERSTANDING OF THE REQUIREMENTS FOR SAFE OPERATION OF MECHANICAL AND ELECTRICAL EQUIPMENT IN POTENTIALLY HAZARDOUS ENVIRONMENTS. THEREFORE, THESE INSTRUCTIONS SHOULD BE INTERPRETED AND APPLIED IN CONJUNCTION WITH THE SAFETY RULES AND REGULATIONS APPLICABLE AT THE SITE AND THE PARTICULAR REQUIREMENTS FOR OPERATION OF OTHER EQUIPMENT AT THE SITE.

THESE INSTRUCTIONS DO NOT PURPORT TO COVER ALL DETAILS OR VARIATIONS IN EQUIPMENT NOR TO PROVIDE FOR EVERY POSSIBLE CONTINGENCY TO BE MET IN CONNECTION WITH INSTALLATION, OPERATION OR MAINTENANCE. SHOULD FURTHER INFORMATION BE DESIRED OR SHOULD PARTICULAR PROBLEMS ARISE WHICH ARE NOT COVERED SUFFICIENTLY FOR THE CUSTOMER/OPERATOR'S PURPOSES THE MATTER SHOULD BE REFERRED TO BAKER HUGHES.

THE RIGHTS, OBLIGATIONS AND LIABILITIES OF BAKER HUGHES AND THE CUSTOMER/OPERATOR ARE STRICTLY LIMITED TO THOSE EXPRESSLY PROVIDED IN THE CONTRACT RELATING TO THE SUPPLY OF THE EQUIPMENT. NO ADDITIONAL REPRESENTATIONS OR WARRANTIES BY BAKER HUGHES REGARDING THE EQUIPMENT OR ITS USE ARE GIVEN OR IMPLIED BY THE ISSUE OF THESE INSTRUCTIONS.

THESE INSTRUCTIONS ARE FURNISHED TO THE CUSTOMER/OPERATOR SOLELY TO ASSIST IN THE INSTALLATION, TESTING, OPERATION, AND/OR MAINTENANCE OF THE EQUIPMENT DESCRIBED. THIS DOCUMENT SHALL NOT BE REPRODUCED IN WHOLE OR IN PART WITHOUT THE WRITTEN APPROVAL OF BAKER HUGHES.

Table of Contents

1	Safety Information	1
2	Introduction.....	2
3	General.....	2
4	Unpacking	2
5	Installation	3
6	Adjustment	3
7	Body Disassembly.....	3
	7.1 Treaded Trim	3
	7.2 Quick-Change Trim.....	3
8	Maintenance & Repair.....	4
	8.1 Threaded Seat Ring Removal.....	4
	8.2 Bushing Removal.....	4
	8.3 Lapping Seats.....	4
	8.3.1 Threaded Trim	4
	8.3.2 Quick-Change Trim.....	5
	8.4 Plug Stem Pinning.....	5
	8.5 Packing Box.....	6
	8.5.1 Carbon/PTFE Rings (Standard).....	6
9	Valve Body Reassembly.....	6
	9.1 Threaded Trim	7
	9.2 Quick-Change Trim.....	7
10	Actuators	7
	10.1 Type 10900 Actuators.....	7
	Assembly Torque Requirements.....	9
	Parts References	10
	Figure 1a - Typical Reducing Application with 535 H Regulator	8
	Figure 1b – Typical Back Pressure Application with 536 H Regulator	8
	Figure 2 – Lubricator Connection (Optional).....	8
	Figure 3 – Seat Lapping Device.....	8
	Figure 4 – Plug Stem Pinning	9
	Figure 5 – Bolt Tightening Sequence.....	9
	Figure 6 – 536 H Configuration.....	11
	Figure 7 – 535 H Configuration.....	11

1. Safety Information

Important - Please Read Before Installation

Masoneilan model 535H/536H pressure regulator instructions contain **DANGER**, **WARNING**, and **CAUTION** labels, where necessary, to alert you to safety related or other important information. Read the instructions carefully **before** installing and maintaining your control valve. **DANGER** and **WARNING** hazards are related to personal injury. **CAUTION** hazards involve equipment or property damage. Operation of damaged equipment can, under certain operational conditions, result in degraded process system performance that can lead to injury or death. Total compliance with all **DANGER**, **WARNING**, and **CAUTION** notices is required for safe operation.



This is the safety alert symbol. It alerts you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.



Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.



Indicates a potentially hazardous situation which, if not avoided, could result in serious injury.



Indicates a potentially hazardous situation which, if not avoided, could result in minor or moderate injury.



When used without the safety alert symbol indicates a potentially hazardous situation which, if not avoided, could result in property damage.

NOTE: Indicates important facts and conditions.

About this Manual

- The information in this manual is subject to change without prior notice.
- The information contained in this manual, in whole or part, shall not be transcribed or copied without Baker Hughes's written permission.
- Please report any errors or questions about the information in this manual to your local supplier.
- These instructions are written specifically for the Masoneilan model 535H/536H pressure regulator, and do not apply for other equipment outside of this product line.

Useful Life Period

The current estimated useful life period for the Masoneilan model 535H/536H pressure regulator is 25+ years. To maximize the useful life of the product it is essential to conduct annual inspections, routine maintenance and ensure proper installation to avoid any unintended stresses on the product. The specific operating conditions will also impact the useful life of the product. Consult the factory for guidance on specific applications if required prior to installation.

Warranty

Items sold by Baker Hughes are warranted to be free from defects in materials and workmanship for a period of one year from the date of shipment provided said items are used according to Baker Hughes recommended usages. Baker Hughes reserves the right to dis-continue manufacture of any product or change product materials, design or specifications without notice.

This instruction manual applies to the Masoneilan model 535H/536H pressure regulators.

NOTE:

- The pressure regulator **MUST BE** installed, put into service and maintained by qualified and competent professionals who have undergone suitable training.
- Under certain operating conditions, the use of damaged equipment could cause a degradation of the performance of the system which may lead to personal injury or death.
- Changes to specifications, structure, and components used may not lead to the revision of this manual unless such changes affect the function and performance of the product.
- All surrounding pipe lines must be thoroughly flushed to ensure all entrained debris has been removed from the system.

2. Introduction

The following instructions should be thoroughly reviewed and understood prior to installing, operating or performing maintenance on this equipment. Throughout the text, safety and/or caution notes will appear and must be strictly adhered to, otherwise, serious injury or equipment malfunction could result.

Serial Plate

The serial plate is usually fixed to the side of the actuator yoke. It indicates information about the valve including size and type, pressure class rating, body/bonnet material, and serial number.

After Sales Service

Baker Hughes offers Masoneilan After Sales Service comprised of highly qualified technicians to support the installation, operation, maintenance and repair of its equipment. For support contact the local Baker Hughes Masoneilan representative or Baker Hughes Masoneilan factory located closest to you.

Spare Parts

Only Masoneilan replacement parts should be used when carrying out maintenance operations. Obtain replacement parts through local Masoneilan representatives or Masoneilan Parts Department.

When ordering spare parts, the **MODEL AND SERIAL NUMBERS** indicated on the manufacturer's serial plate **MUST BE GIVEN**. The serial plate is on the side of the actuator yoke.

Actuator and Accessories

Actuators and other valve accessories have their own instruction manuals that provide information and details on the assembly and installation. Refer to the appropriate instruction manual for each unique accessory.

3. General

These installation and maintenance instructions apply to all sizes and ratings of the Masoneilan 535H/536H model regulators regardless of the type of trim used.

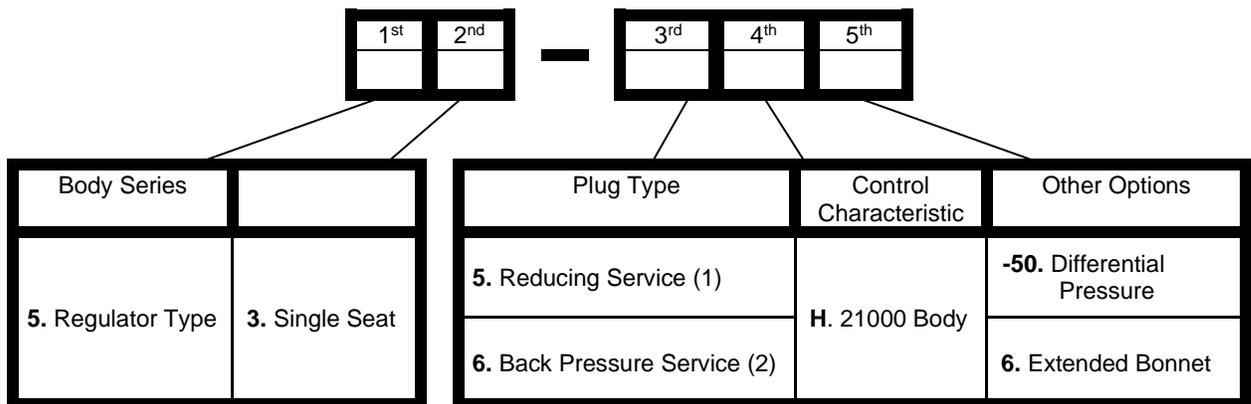
535H/536H model single ported top guided regulators are designed with built in versatility making them well-suited to handle a wide variety of process applications.

Standard construction offers a contoured plug with a threaded seat ring or a quick change seat ring. The heavy top plug guiding provides maximum support to ensure plug stability. A series of reduced area trim is available to provide wide flow range capabilities in all regulator sizes. Tight Shutoff Class IV leakage is standard.

Recommended spare parts required for maintenance are listed in the Parts Reference table on page 11. The model number, size, rating and serial number of the valve are shown on the identification tag located on the actuator. Refer to the below chart for the 535H/536H numbering system.

4. Unpacking

Care must be exercised when unpacking the regulator to prevent damage to the accessories and component parts. Should any problems arise, contact the local Masoneilan Representative or After Sales Department.



- (1) Downstream Pressure Controlled (See Figure 1a)
- (2) Upstream Pressure Controlled (See Figure 1b)

5. Installation

Before installing, blow out line thoroughly to remove all foreign matter which might foul the valve. Place the regulator in a horizontal run of pipe so that the controlled fluid will flow through the valve in the direction indicated by the arrow on the valve body or the words IN and OUT marked on the connections. On steam service, the valve should be installed with the diaphragm actuator down so that the diaphragm will be protected by a water seal. If installed otherwise, an adequate water seal must be incorporated.

Pipe the controlled pressure from a convenient point in the line 6-10 feet from the regulator (or in the discharge line 6-10 feet from the pump on pump pressure applications) to the ½" NPT connection in the diaphragm case. Install a gauge and a needle valve in the control line. The valve permits shutting off the control line and also serves as an adjustable choke to prevent cycling of the regulator, which may result from the pulsation of a pump in the system.

A three-valve bypass around the regulator permits removing the regulator from the line without shutting down the system.

6. Adjustment

When pressure setting is specified, the regulator is set accordingly at the factory; otherwise it is set at the minimum of the range shown on the serial plate.

Open stop valve on the outlet side of the regulator and partially open stop valve on the inlet side, allowing pressure in the system to build up slowly. Then open control line valve and check setting by means of the gauge. To increase pressure setting, turn adjusting screw clockwise to compress the spring. To decrease the setting, turn adjusting screw counterclockwise to relieve spring compression. Fully open stop valve on the inlet side of the regulator.

7. Body Disassembly

Access to the internal components of the body should be accomplished with the actuator removed. To remove the actuator from the body, refer to the actuator instruction GEA31593 for 10900 Series Actuators.



Prior to performing maintenance on the valve, isolate the valve and vent the process pressure.

7.1 Threaded Trim

After removing the actuator, disassemble the body using the following procedure:

- A. If there is a leak detector connection on the lateral NPT port of the bonnet, disconnect this piping as well.
- B. Remove body stud nuts (10).
- C. Remove bonnet (8), and plug stem (1) and plug (16) sub-assembly together as one unit.

NOTE: Spiral wound body gaskets (15) are standard in the 500 Series design and it is imperative that a new gasket be installed each time the valve is disassembled.

- D. Remove packing flange stud nuts (3), packing flange (4) and packing follower (5).
- E. Remove plug (16) and plug stem (1) sub-assembly from the bonnet (8).

CAUTION

Care must be taken to avoid damage to the plug and plug guide.

- A. Remove old packing (6) [and optional lantern ring (7) if a leak detection connection has been installed]. Refer to Figure 2.
- B. Bonnet (8), plug (16), bushing (12) and seat ring (14) may now be inspected for wear and service damage. After determining the maintenance required, proceed to the appropriate Section of this instruction manual.

7.2 Quick-Change Trim

After removing the actuator, disassemble the body using the following procedure:

- A. If there is a leak detection connection on the lateral NPT port of the bonnet, disconnect this piping as well.
- B. Remove body stud nuts (10).
- C. Remove bonnet (8), and plug stem (1) and plug (16) sub-assembly together as one unit.
- D. Since the cage (13), seat ring (14) and seat ring gasket (15) are held in place by the bonnet, they may now be removed.

NOTE: Spiral wound gaskets (11 & 15) are standard in the 500 Series design and it is imperative that new gaskets be installed each time the valve is disassembled.

- E. Remove packing flange stud nuts (3), packing flange (4) and packing follower (5)
- F. Remove plug (16) and plug stem (1) sub-assembly from the bonnet (8).

CAUTION

Care must be taken to avoid damage to the plug and plug guide.

- G. Remove old packing (6) [and optional lantern ring (7) if a leak detection connection has been installed]. Refer to Figure 5.
- H. All components may now be inspected for wear and service damage. After determining the maintenance required, proceed to the appropriate Section of this instruction manual.

8. Maintenance & Repair

The purpose of this section is to provide recommended maintenance and repair procedures. These procedures assume the availability of standard shop tools and equipment.

8.1 Threaded Seat Ring Removal

Threaded seat rings (14) are installed tightly by the manufacturer, and after years of service they may be difficult to remove.

To facilitate removal, seat ring wrenches can be fabricated to engage the seat ring lugs and adapted to a standard wrench. If the seat ring is exceptionally resistant to removal, the application of heat or penetrating oil should be helpful.

Caution: When using heating devices, insure that proper safety practices are observed. Flammability and toxicity of the process fluid must be considered and proper precautions taken.

8.2 Bushing Removal

The bushing (12) is press fit into the bonnet and does not normally require replacement. If necessary, it may be pulled or machined out. When machining the bushing out, care must be taken to maintain proper dimensions and tolerances in the bonnet. These will be furnished upon request.

8.3 Lapping Seats

Lapping is the process of working the valve plug against the seat ring with an abrasive to produce a close fit. If valve leakage is excessive, lapping becomes necessary. The plug and seat ring seating surfaces should be free of large scratches or other defects, and the contact surfaces of the seats should be as narrow as possible. This may require dressing both parts in a lathe. The seating surface angle of the plug is 28 degrees and the seat ring is 30 degrees (relative to the centerline axis). A good grade of fine grinding compound is required for the lapping operation. The compound should be mixed with a small quantity of lubricant such as graphite. This will slow the cutting rate and prevent tearing of the seating surfaces. The amount of lapping required depends on the materials, condition of seating surfaces, and accuracy of machining. If a short period of lapping does not visibly improve seating, there is usually no advantage in continuing as excessive lapping may result in rough seats. The only remedy is replacement or re-machining of one or both parts. When lapping new

plugs and seat rings, begin with a medium fine (240 grit) and finish with a finer grade (600 grit).

NOTE: Lapping should produce a line contact area, not the entire surface, due to the difference in seat angles.

Caution: Before lapping, the plug and stem sub-assembly must be concentric. (See pinning operation, section 8.4).

8.3.1 Threaded Trim

1. Clean body gasket surface areas.
2. When seat has been removed, insure that the sealing surface in the body bridge and the threads are thoroughly cleaned.

NOTE: A sealant compatible with the process should be applied **sparingly** to the seat ring threads and sealing shoulder.

3. Install and tighten seat ring using fabricated wrench used for removal.

CAUTION

Do not over-tighten. Do not strike seat ring lugs directly. This could distort the seat ring resulting in seat leakage.

4. Apply lapping compound on the plug at several spots equally spaced around the seating area.
5. Insert the stem and plug sub-assembly carefully into the body until it is seated.
6. Place bonnet (8) on the body and fasten the bonnet to the body using four body stud nuts (10) spaced equally apart. Apply slight pressure and tighten evenly.

CAUTION

Do not tighten nuts to final torque specifications at this time. The bonnet is used temporarily for guiding purposes only.

7. Insert two or three pieces of packing (6) into the packing box to assist in guiding the stem and plug during lapping.
8. Screw a drilled and tapped rod with a T-handle onto the plug stem and secure with a locknut (see Figure 4).

NOTE: As an alternative, drill a hole through a flat steel plate and fasten to the plug stem using two locknuts.

9. Apply slight pressure on the stem, and rotate the stem in short oscillating strokes (around 8 to 10 times). Repeat this step as necessary.

NOTE: The plug should be lifted and turned 90° each time before repeating Step (9). This intermittent lifting is required to keep the plug and seat ring concentric during lapping.

CAUTION

Avoid over-lapping as this can cause damage to the seating surface rather than improve leakage performance.

10. After completion of the lapping operation, remove bonnet and plug. The seating area of the seat ring and the plug must be cleaned of all lapping compound in preparation for reassembly. **Do not remove seat ring.**

8.3.2 Quick-Change Trim

1. Clean body gasket surface areas.
2. Install a new seat ring gasket (15) and insert seat ring (14) in the body.

NOTE: Gasket (11) is temporarily placed to hold the seat ring during lapping.

It is imperative to use a new gasket or a test part having the same geometrical characteristics in order to insure the correct position of the seat ring during lapping.

This gasket (or similar part) can be kept after lapping for future use.

The gasket used for lapping must not be reused for the body reassembly.

3. Apply lapping compound at several spots equally spaced around the seating area of the seat ring.
4. Insert the cage (13) into the body.
5. Insert the stem and plug sub-assembly carefully into the body until it is seated.
6. Place bonnet (8) on the body.

CAUTION

Insure that the seat ring (14), cage (13) and bonnet (8) are properly aligned.

7. Fasten the bonnet to the body using four body stud nuts (10) spaced equally apart. Apply slight pressure and tighten evenly.

CAUTION

Do not tighten nuts to final torque specifications at this time. The bonnet is used temporarily for guiding purposes only.

8. Insert two or three pieces of packing into the packing box to assist in guiding the stem and plug during lapping.
9. Screw a drilled and tapped rod with a T-handle onto the plug stem and secure with a locknut (see Figure 4).

NOTE: As an alternative, drill a hole through a flat steel plate and fasten to the plug stem using two locknuts.

10. Apply slight pressure on the stem, and rotate the stem in short oscillating strokes (around 8 to 10 times). Repeat this step as necessary.

NOTE: The plug should be lifted and turned 90° each time before repeating Step (10). This intermittent lifting is required to keep the plug and seat ring concentric during lapping.

11. After completion of the lapping operation, remove bonnet and internal parts. The seating area of the seat ring and the plug must be cleaned of all lapping compound in preparation for reassembly.

8.4 Plug Stem Pinning

Plug stem pinning in the field may be required for the following:

- Replacing existing plug and stem, or
- Replacing existing stem only

Replacing Plug and Stem

If it is necessary to replace the plug, then the plug stem must be replaced at the same time. The original pin hole in an existing stem will not provide the necessary fit, and might seriously impair the strength of the assembly.

1. Reference Marking on the Plug Stem
2. Measure the depth of the pilot recess in the plug (Dimension X in Figure 9), and make a reference mark on the plug stem at the same distance from the thread.
3. Screwing Stem to Plug
 - 3.1. Hold the plug (with vise jaw assembly) in a vise.
 - 3.2. Lock two nuts against each other on the end of the new plug stem, and screw the stem **solidly** into the plug using a wrench on the upper nut. When properly assembled, the reference mark (see Section A above) should be flush with the end of the plug guide.
4. Drilling the New Parts
 - 4.1. **If the plug is already fully drilled** (typical for 440C hardened stainless steel material or solid stellite), then drill the stem to the same diameter (Diameter C in Figure 4) as the plug shank hole.
 - 4.1.1. If the plug guide area has a center mark, place the plug guide on a V-block and use a suitable drill size to either match the hole size in the plug, or match Diameter C (see Figure 4)
 - 4.1.2. Drill through the plug-stem assembly.
 - 4.2. **If the plug guide area does not have any hole or any center mark,**
 - 4.2.1. Measure Dimension D based on the plug guide diameter and stem diameter (see Figure 4).
 - 4.2.2. Place the plug guide on a V-block, and make a center mark on the plug guide area using a center punch.
 - 4.2.3. Drill through the plug-stem assembly using a suitable size drill bit.

NOTE: In all cases after drilling: Remove any burrs from the plug guide hole by making a slight chamfer.

5. Pinning the Plug-Stem Assembly
 - 5.1. Select the correct size pin based on the plug guide diameter and stem diameter (see Figure 9). Apply a small amount of grease on the pin and hand assemble it into the hole in the plug.
 - 5.2. Press fit the pin into the hole using a hammer. Complete the pinning operation by taking care to ensure that the pin is recessed by the same amount at both sides (see Figure 4).
 - 5.3. After the plug has been pinned, it should be placed in a lathe to insure it is concentric with the stem.
 - 5.4. If the assembly is not running true, then the stem should be placed in a collet with the plug guide against it and the plug should be adjusted. Alignment of plug stem can be performed by means of a soft faced mallet.

Replacing Existing Stem Only

1. Removing Existing Pin and Stem
 - 1.1. Place the plug guide on a V-block and use a drift punch to drive out the old pin.

NOTE: If it is necessary to drill out the pin, use a drill bit slightly smaller than the pin diameter.

- 1.2. Hold the plug guide in a vise (see note on opposite side of page).
- 1.3. Lock one nut against another at the end of the plug stem. Using a wrench on the lower nut, unscrew the stem from the plug. The stem is removed by turning it counterclockwise.
2. Screwing Stem to Plug
 - 2.1. Refer to step B of the previous section on "REPLACING PLUG AND STEM".
3. Drilling the New Stem
 - 3.1. Place the plug guide on a V-block and use a suitable size drill bit to drill the stem (use the hole in the plug as a guide).

NOTE: If the hole in the plug guide has been slightly damaged while removing the old pin, choose a drill bit and a pin with a slightly larger diameter than the normal pin.

4. Pinning
 - 4.1. Select the correct size pin based on the plug guide diameter and pin hole diameter. Proceed as described in part D of the previous section, taking care not to damage the plug guide area.
 - 4.2. Ensure plug stem alignment following the pinning operation

8.5 Packing Box

Packing box maintenance is one of the principle action items of routine servicing. Tightness of the packing is maintained by packing compression. Compression is achieved by evenly tightening the packing flange nuts (3) against the packing flange (4). Care must be taken not to over tighten as this could prevent smooth operation of the valve. If all compression is used up and the valve leaks, then new packing is required.



Valve must be isolated and the pressure vented before performing packing box maintenance. Proceed as follows:

8.5.1 Carbon/PTFE Rings (Standard)

NOTE: The Carbon/PTFE packing rings have a skive cut allowing packing replacement without disconnecting the plug stem from the actuator connector or actuator stem.

- A. Loosen and remove packing flange nuts (3).
- B. Lift the packing flange (4) and packing follower (5) up the valve stem.

NOTE: These parts may be secured using tape or wire to keep them out of the way before proceeding.

- C. By means of a hooked instrument, remove packing (6) insuring not to damage the sealing surfaces of the packing box or plug stem.

NOTE: On valves equipped with an optional lubricator connection, the lantern ring (7) must also be removed to gain access to lower packing rings.

- D. Replace packing rings (6).

NOTE: Assemble and compress rings one at a time into packing box. The skive cut of each packing ring must be placed about 120 degrees apart.

NOTE: On valves equipped with an optional lubricator connection, refer to Figure 2 for correct amount of rings to place under the lantern ring (7).

- E. Replace packing follower (5) and packing flange (4).
- F. Replace and tighten packing stud nuts (3).



Do not over tighten.

- G. Place valve back in service and only tighten packing as necessary to stop external leakage.

NOTE: In an emergency, string packing may be used as a temporary repair only. It must be replaced with the correct packing as soon as possible.

9. Valve Body Reassembly

After completion of the required maintenance, the valve should be reassembled using the following procedures:

NOTE: If any of the following steps were completed during maintenance, then proceed to the next step.

9.1 Threaded Trim

- A. Clean all gasket mating surfaces.
- B. Apply a small amount of sealant to the seat ring threads and sealing shoulder. Install seat ring into valve body.

NOTE: A sealant compatible with the process should be applied **springly**.

- C. Install and tighten seat ring using wrench used for removal.

CAUTION

Do not over-tighten. Do not strike seat ring lugs directly. This could distort the seat ring resulting in unwarranted seat leakage.

- D. Carefully install plug and stem assembly.

NOTE: Valve should be lapped before final assembly. See Section 7.3.

- E. Install body gasket (15).

NOTE: Spiral wound body gaskets (11 & 15) are standard in the 500 Series design. It is imperative that a new gasket be installed each time the valve is disassembled.

- F. Assemble bonnet (8) and body stud nuts (10). Bonnet must be positioned so the packing flange studs are at 90° to the flow center line.

CAUTION

Tighten nuts (10) until metal to metal contact is obtained with proper bolt torque. Refer to Table 1 for proper bolt torque and tightening sequence specifications.

- G. Insert packing (6) (and lantern ring (7) on valves equipped with an optional lubricator connection). Refer to Section 8.5 for proper packing assembly procedure for standard or optional designs.
- H. Install packing follower (5) and packing flange (4).
- I. Install packing flange stud nuts (3).

CAUTION

Do not over tighten (See Section "8.5. Packing Box").

- J. If a leak detection connection was installed, connect it on the lateral NPT port in the bonnet. If not, insure that the 1/4" NPT plug remained in place (Figure 2).
- K. For actuator assembly and plug stem adjustment, proceed to the actuator instruction 31593 for 10900 Series Actuators.

9.2 Quick-Change Trim

- A. Clean all gasket mating surfaces.
- B. Install seat ring gasket (11) and seat ring (14).

NOTE: Spiral wound gaskets (11 & 15) are standard in the 500 Series design. It is imperative that a new gasket be installed each time the valve is disassembled.

- C. Install cage (13).
- D. Carefully install plug and stem assembly.

NOTE: Valve should be lapped before final assembly. See Section 8.3.

- E. Install body gasket (15).
- F. Assemble bonnet (8) and body stud nuts (10) and tighten. Bonnet must be positioned so the packing flange studs are at 90° to the flow center line.

CAUTION

Care must be taken to ensure that the cage, seat, and bonnet are properly aligned in the body.

Cage should be installed with parts at lower end, near seat ring. Tighten nuts (10) until metal to metal contact is obtained with proper bolt torque. Refer to Figure 5 for proper bolt torque and tightening sequence specifications.

- G. Insert packing (6) [and lantern ring (7) on valve equipped with an optional lubricator connection]. Refer to Section 8.5 for proper packing assembly procedure for standard or optional designs.
- H. Install packing follower (5) and packing flange (4).
- I. Install packing flange stud nuts (3).

CAUTION

Do not over tighten (See Section "8.5. Packing Box").

- J. If a leak detection connection was installed, connect it on the lateral NPT port in the bonnet. If not, insure that the 1/4" NPT plug remained in place (Figure 2).
- K. For actuator assembly and plug stem adjustment, proceed to the actuator instruction 31593 for 10900 Series Actuators.

10. Actuators

10.1 Type 10900 Actuators

Refer to actuator instruction 31593 for removal, maintenance, assembly and adjustment.

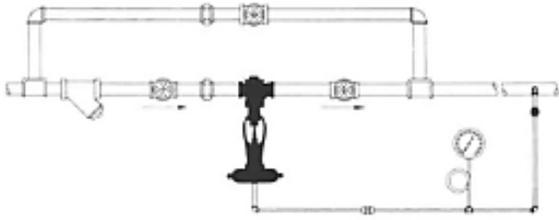


Figure 1a:
Typical Reducing Application with 535 H Regulator

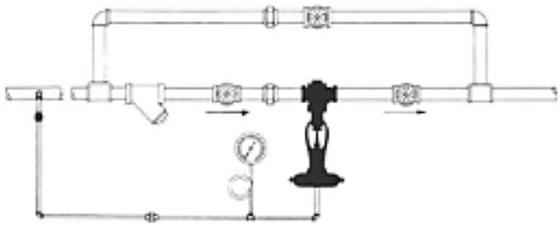


Figure 1b:
Typical Back Pressure Application with 536 H Regulator

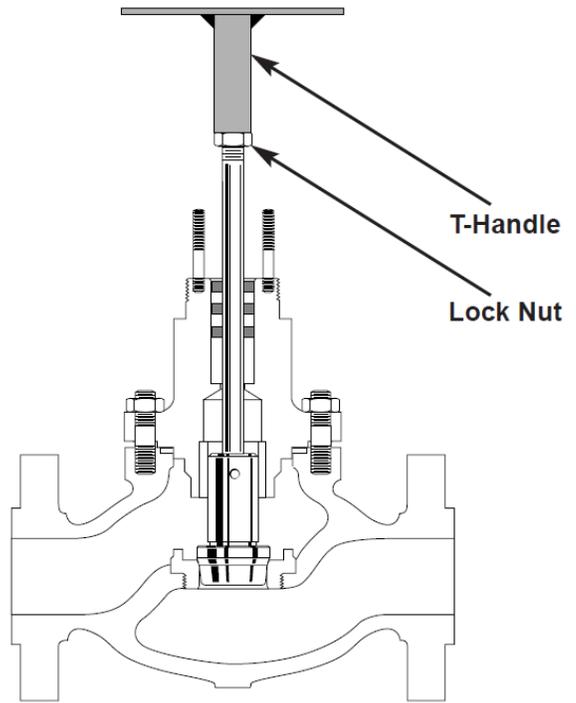


Figure 3: Seat Lapping Device

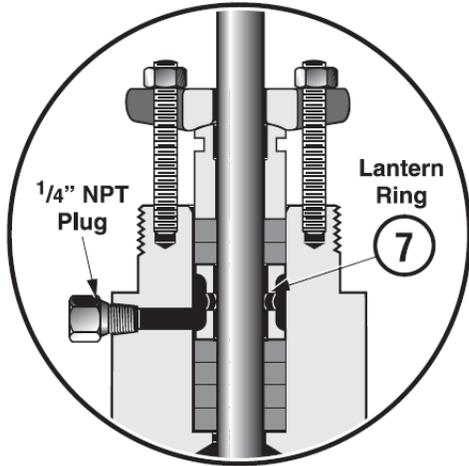


Figure 2: Lubricator Connection (Optional)

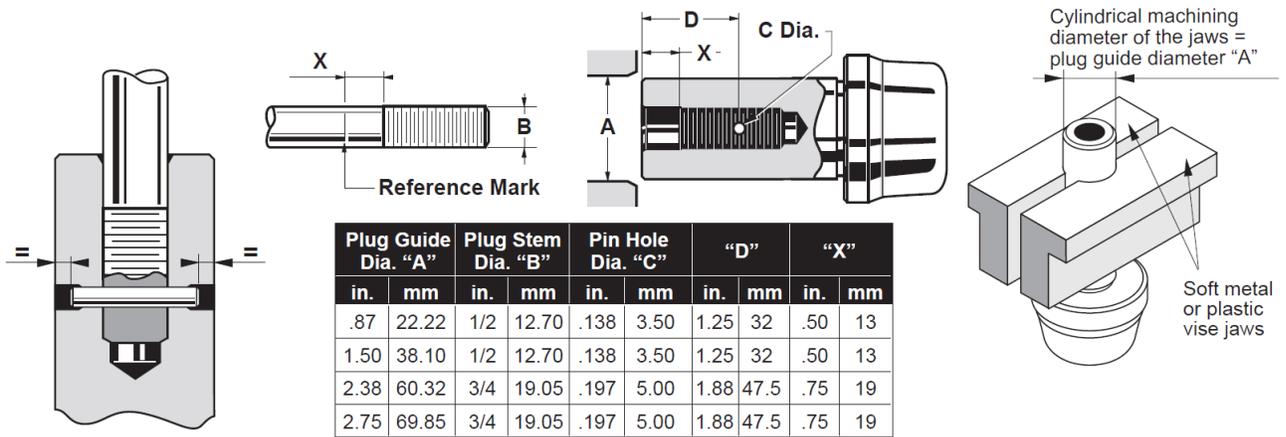


Figure 4: Plug Stem Pinning

Table 1: Assembly Torque Requirements:

Valve Size		ASME Class	Bolting Requirements		Torque Requirements					
					Minimum		Maximum		Pre-Load	
Inch	mm		Qty	Size (inch)	Lbs.F t	N.m	Lbs.F t	N.m	Lbs.F t	N.m
3/4	20	150 & 300	4	1/2"-13NC-2A	25	34	66	89	5	7
		600	4	1/2"-13NC-2A	25	34	66	89	5	7
1	25	150 & 300	4	1/2"-13NC-2A	25	34	66	89	5	7
		600	4	1/2"-13NC-2A	25	34	66	89	5	7
1 1/2	40	150 & 300	8	1/2"-13NC-2A	25	34	66	89	5	7
		600	8	1/2"-13NC-2A	25	34	66	89	5	7
2	50	150 & 300	8	1/2"-13NC-2A	25	34	66	89	5	7
		600	8	1/2"-13NC-2A	25	34	66	89	5	7

- Notes:
1. Do not exceed Maximum Torque values listed.
 2. Tighten in increments until required torque levels are reached.
 3. Reject assembly if metal-to-metal contact is not achieved after reaching Maximum Torque.
 4. Torque requirements shown are for standard B7 studs and 2H nuts.

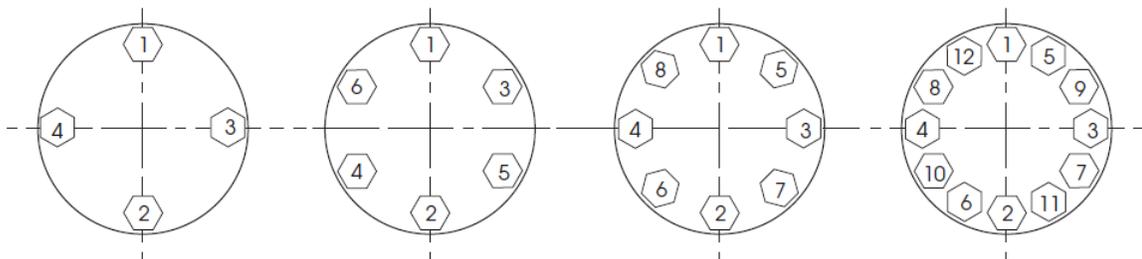
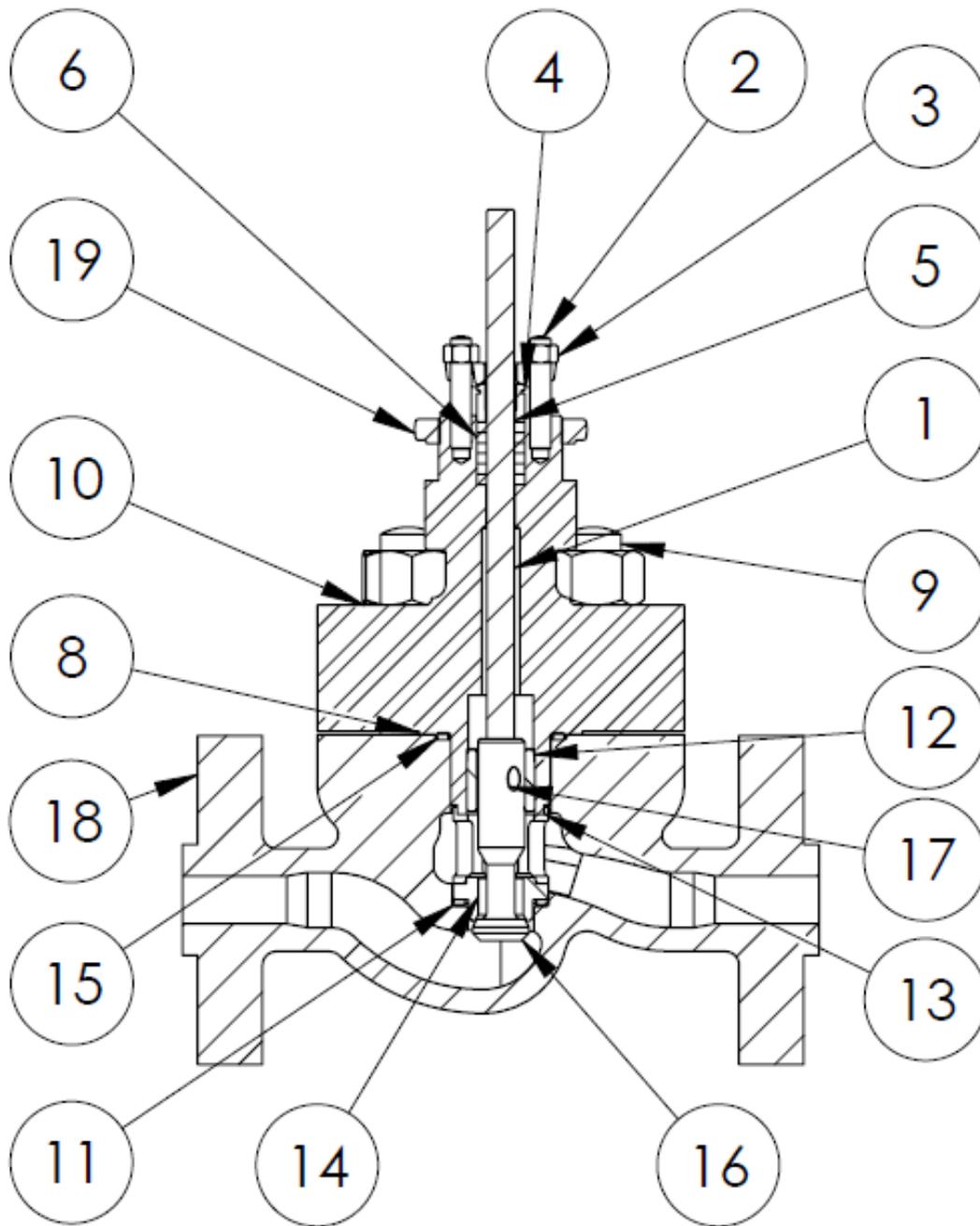


Figure 5: Bolt Tightening Sequence

Parts References



Ref.	Part Name	Ref.	Part Name	Ref.	Part Name
• 1	Plug Stem	8	Bonnet	• 15	Seat Ring Gasket
2	Packing Flange Stud	9	Body Stud	• 16	Plug
3	Packing Flange Stud Nut	10	Body Stud Nut	• 17	Plug Pin
4	Packing Flange	• 11	Body Gasket	18	Body
5	Packing Follower	12	Plug Guide Bushing	19	Drive Nut
• 6	Packing	• 13	Cage		
7	Lantern Ring (Optional)	• 14	Seat Ring		

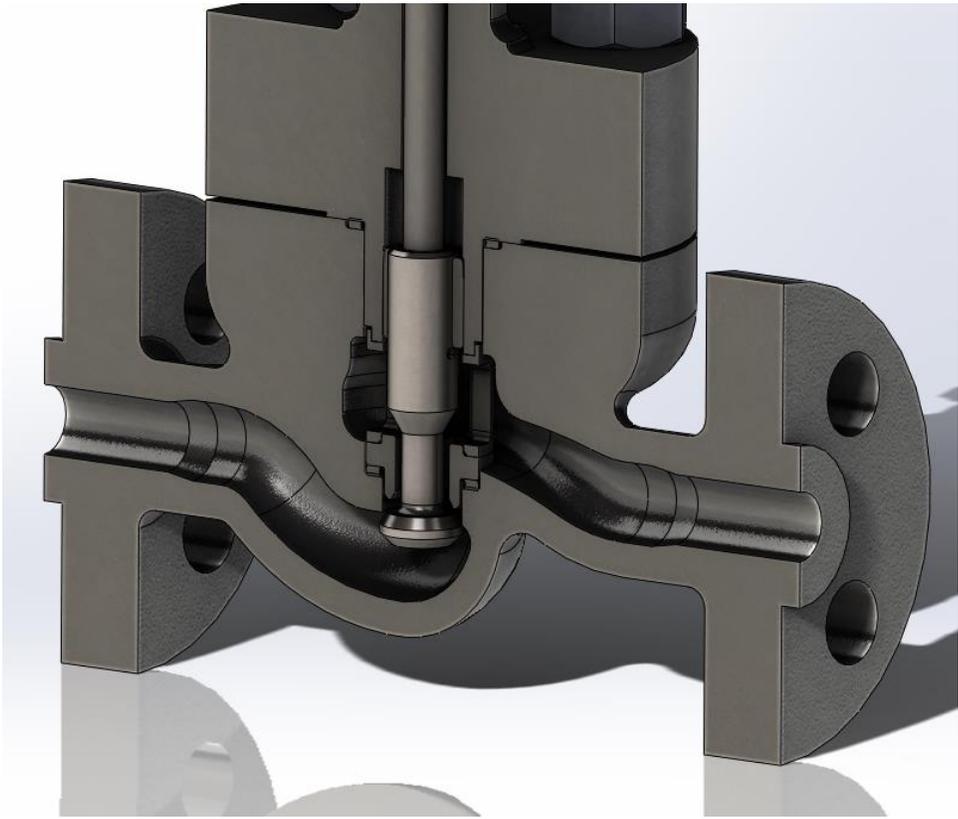


Figure 6: 536 H Configuration

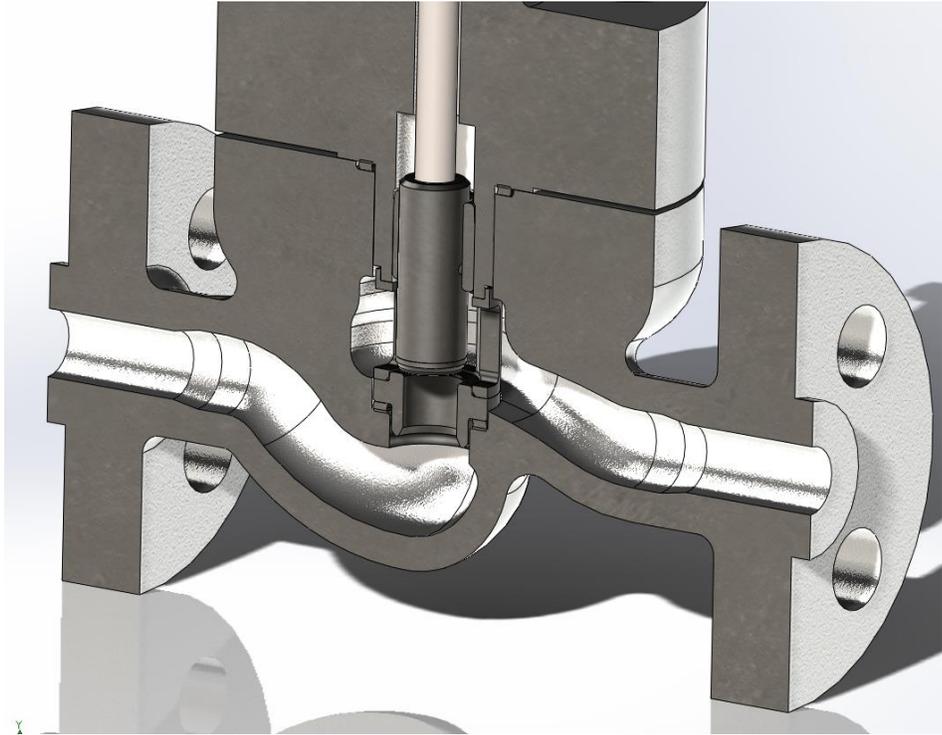


Figure 7: 535 H Configuration

Direct Sales Office Locations

Australia

Brisbane
Phone: +61-7-3001-4319

Perth

Phone: +61-8-6595-7018

Melbourne

Phone: +61-3-8807-6002

Brazil

Phone: +55-19-2104-6900

China

Phone: +86-10-5738-8888

France

Courbevoie
Phone: +33-1-4904-9000

India

Mumbai
Phone: +91-22-8354790

New Delhi

Phone: +91-11-2-6164175

Italy

Phone: +39-081-7892-111

Japan

Tokyo
Phone: +81-03-6871-9008

Korea

Phone: +82-2-2274-0748

Malaysia

Phone: +60-3-2161-03228

Mexico

Phone: +52-55-3640-5060

Russia

Veliky Novgorod
Phone: +7-8162-55-7898

Moscow

Phone: +7-495-585-1276

Saudi Arabia

Phone: +966-3-341-0278

Singapore

Phone: +65-6861-6100

South Africa

Phone: +27-11-452-1550

South & Central America and the Caribbean

Phone: +55-12-2134-1201

Spain

Phone: +34-935-877-605

United Arab Emirates

Phone: +971-4-8991-777

United Kingdom

Phone: +44-7919-382-156

United States

Houston, Texas
Phone: +1-713-966-3600

Find the nearest local Channel Partner in your area:

valves.bakerhughes.com/contact-us

Tech Field Support & Warranty:

Phone: +1-866-827-5378
valvesupport@bakerhughes.com

valves.bakerhughes.com

Copyright 2020 Baker Hughes Company. All rights reserved. Baker Hughes provides this information on an "as is" basis for general information purposes. Baker Hughes does not make any representation as to the accuracy or completeness of the information and makes no warranties of any kind, specific, implied or oral, to the fullest extent permissible by law, including those of merchantability and fitness for a particular purpose or use. Baker Hughes hereby disclaims any and all liability for any direct, indirect, consequential or special damages, claims for lost profits, or third party claims arising from the use of the information, whether a claim is asserted in contract, tort, or otherwise. Baker Hughes reserves the right to make changes in specifications and features shown herein, or discontinue the product described at any time without notice or obligation. Contact your Baker Hughes representative for the most current information. The Baker Hughes logo and Maseonellan are trademarks/is a trademark of Baker Hughes Company. Other company names and product names used in this document are the registered trademarks or trademarks of their respective owners.

Baker Hughes 

bakerhughes.com