



INSTRUCTION
MANUAL

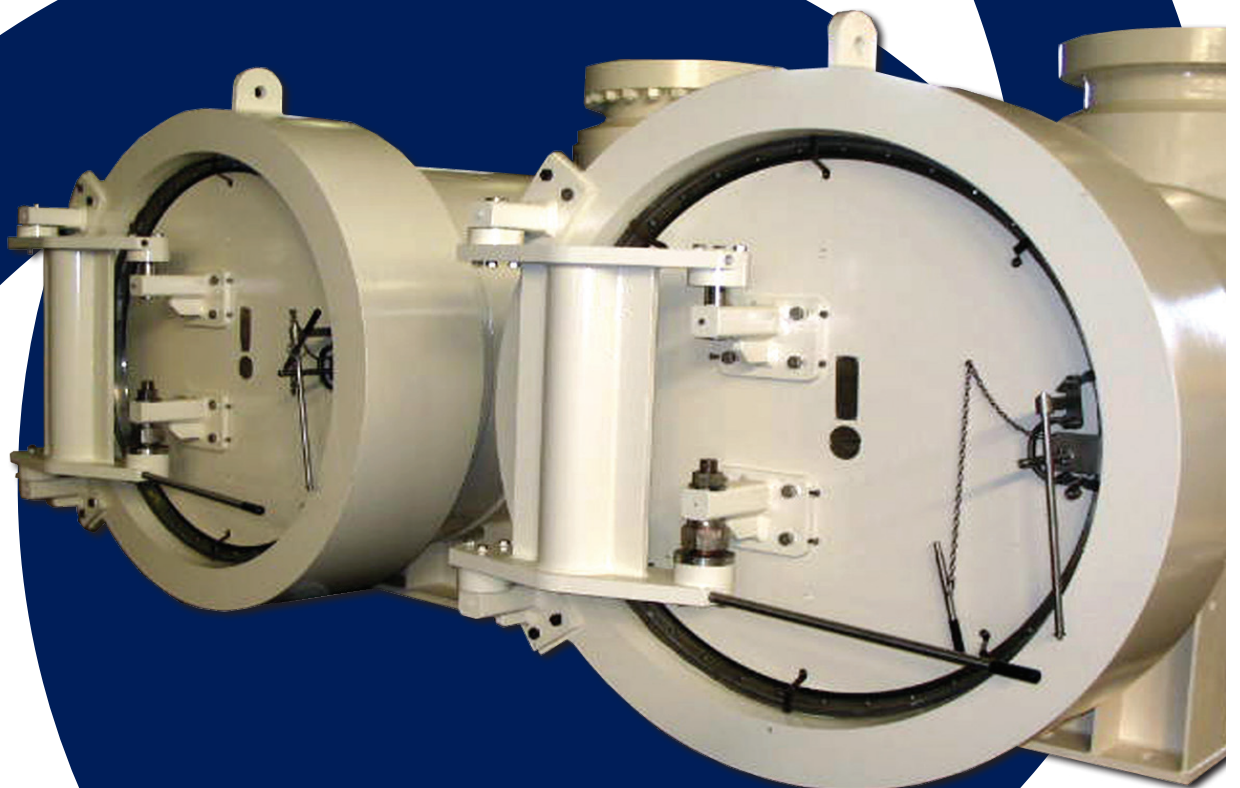
HORIZONTAL BANDLOCK™ 2 CLOSURE

INSTALLATION, OPERATION
AND MAINTENANCE MANUAL

ISSUED: 09/2020

GD ENGINEERING®

READ AND UNDERSTAND THIS MANUAL PRIOR
TO OPERATING OR SERVICING THIS PRODUCT.



IMPORTANT NOTE:

No modifications, alterations or additions to this closure shall be made without the prior written agreement of GD Engineering.

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The Bandlock™2 Closure is designed to provide safe operation at the pressure/temperature rating shown on the nameplate and to comply fully with the design conditions stated in the purchase order.

BANDLOCK 2 盲板按照铭牌上标注的压力/温度设计以提供安全的操作且该设计完全满足订单要求.

“It is the responsibility of the end user to consider the effect or consequence of any other loading or operating conditions that might be applied in service.”

实际应用中如出现其他操作工况而导致的结果或产生的影响由用户承担责任.

SAFETY WARNING: OBSERVE SAFETY PRECAUTIONS AT ALL TIMES

安全警示：请每时每刻注意安全须知

The parent vessel **MUST** be fully drained, isolated from any pressure source and vented before opening the vessel.

主筒体在开启前务必 100%防空，排污。

OBSERVE PERMIT TO WORK PROCEDURES AND SAFETY PRECAUTIONS AT ALL TIMES

请每时每刻注意工作程序和安全保护措施

1.0 HORIZONTAL CLOSURE COMPONENTS 部件草图
(Major components identification sketch)

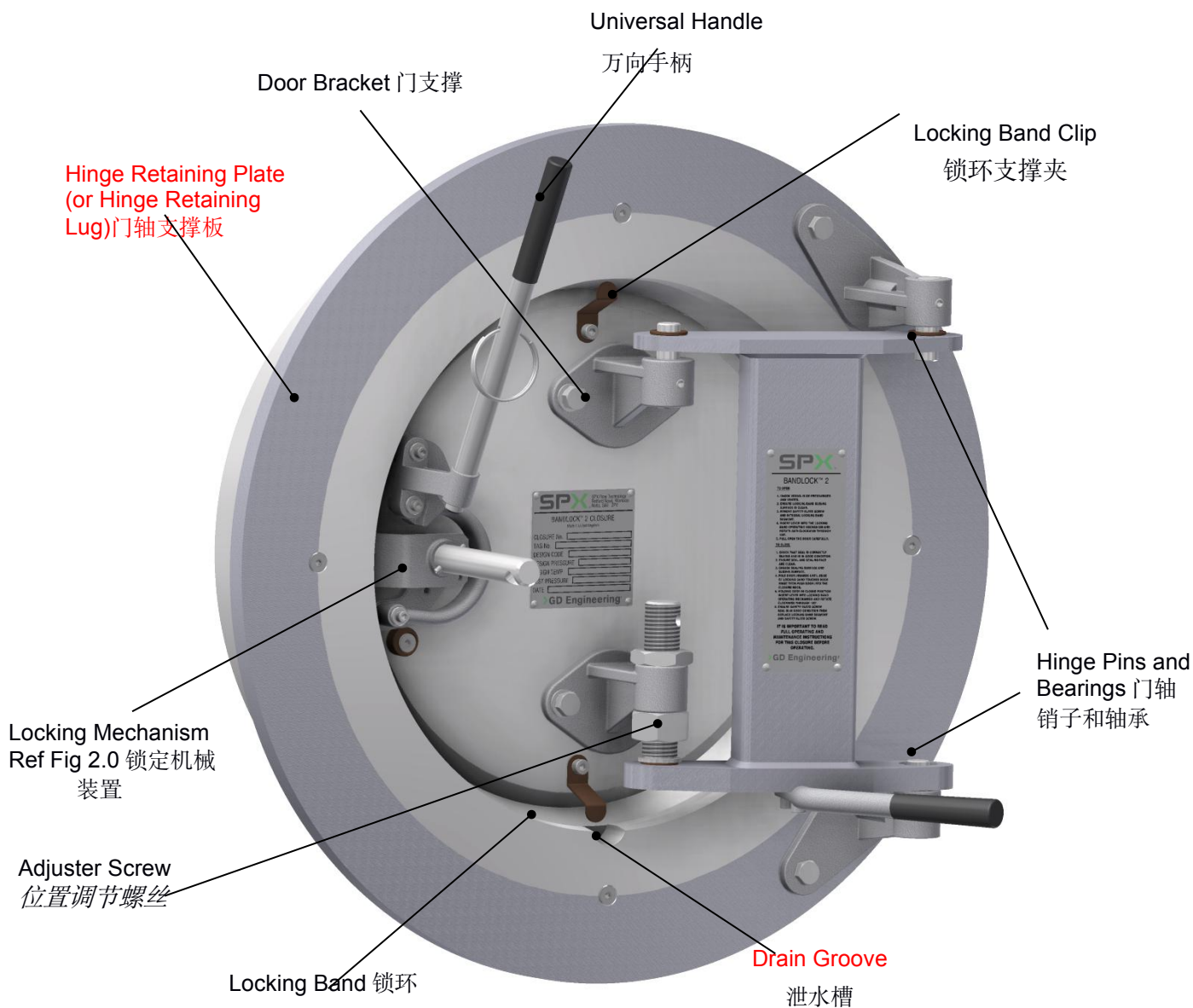


Fig 1.0 – Bandlock™ 2 Closure Components.

1.1 HORIZONTAL CLOSURE LOCKING MECHANISM COMPONENTS 锁定机械装置部件
(Major components identification sketch 主要部件识别图)

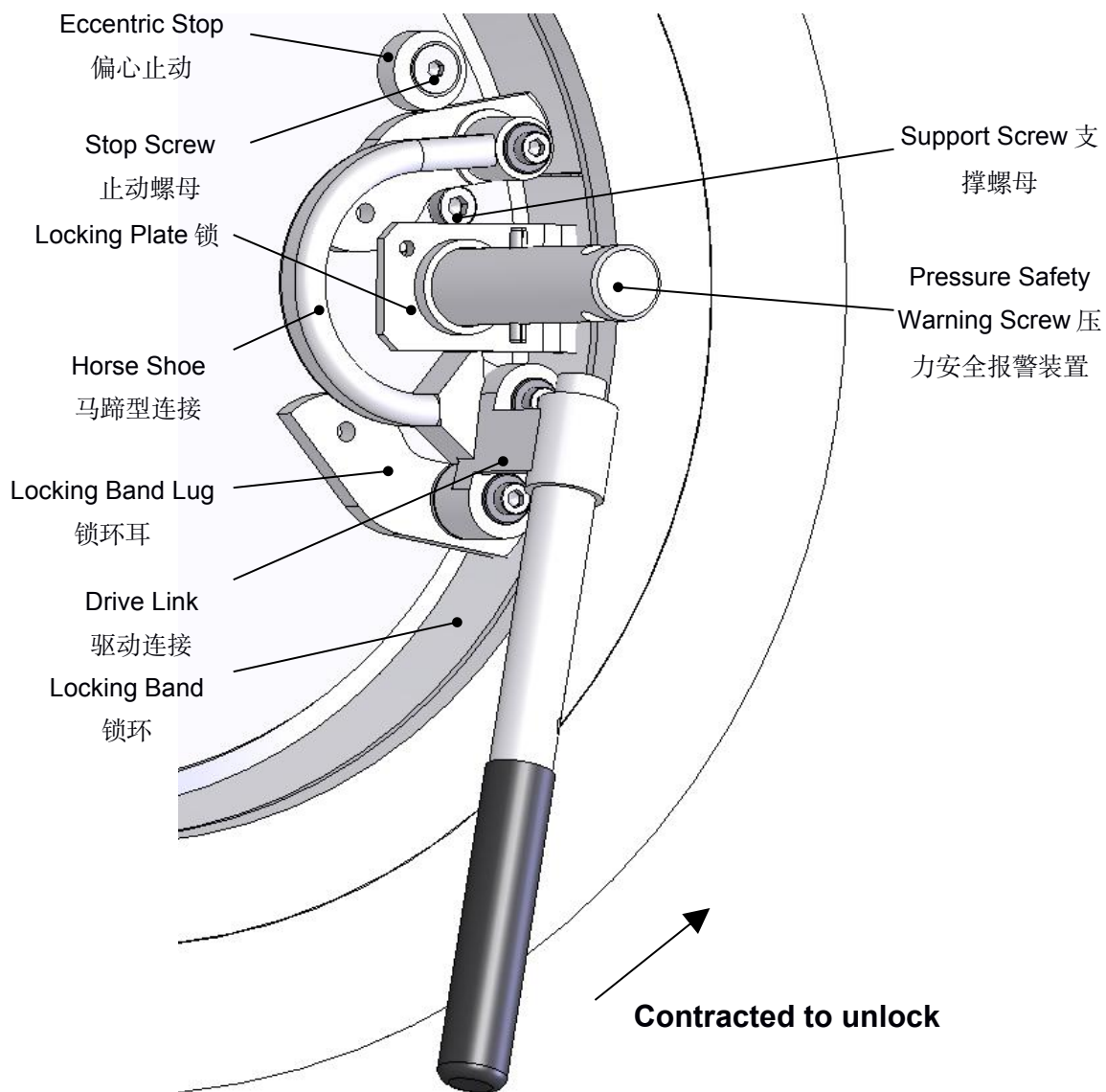


Fig 2.0 – Bandlock™ 2 Closure Locking Mechanism Components.

1.2 BANDLOCK™2 CLOSURE PRESSURE WARNING SCREW & LOCKING SEGMENT ASSEMBLY (Major components identification sketch (压力报警螺栓和锁环段总成部件图

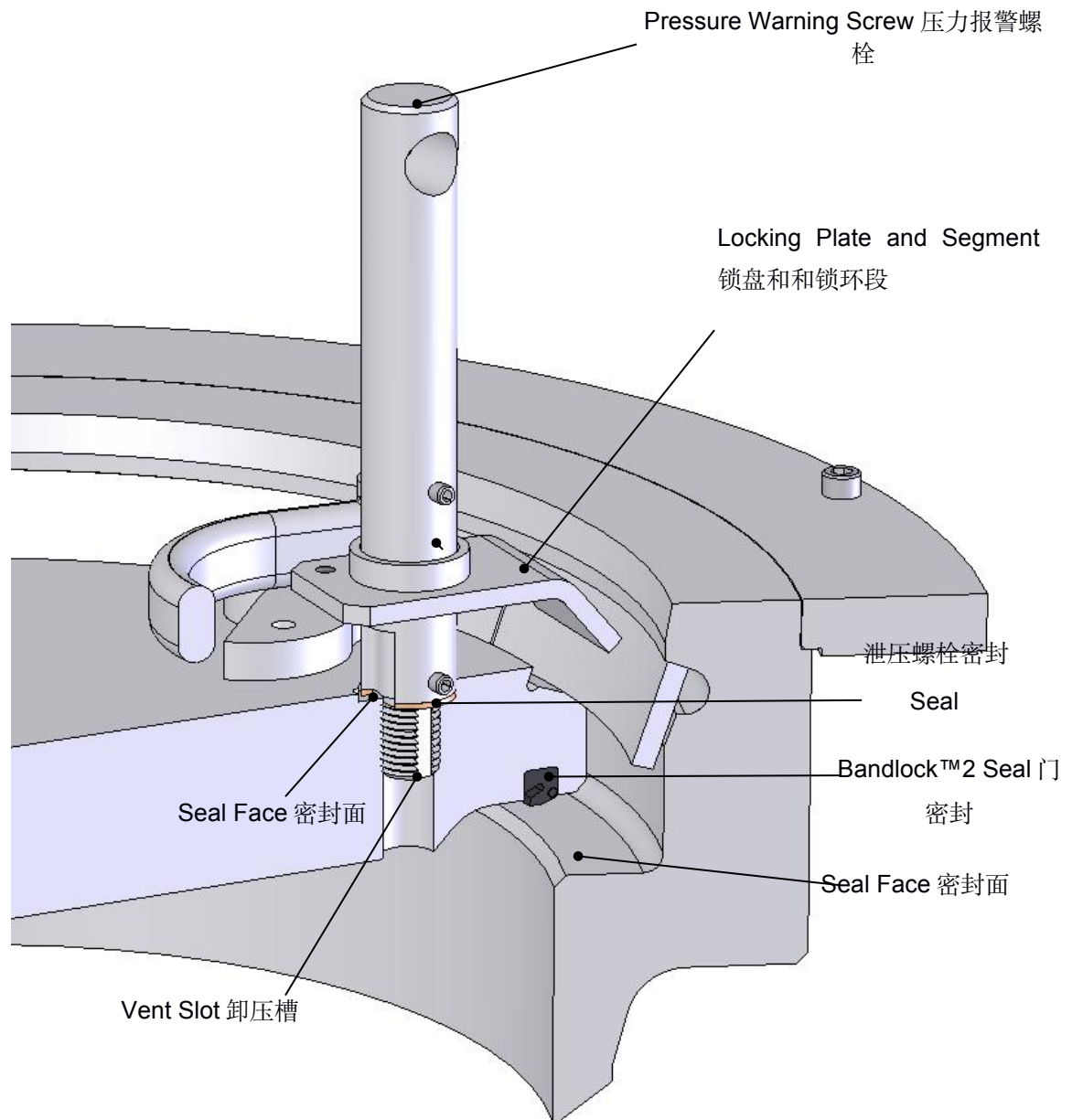


Fig 3.0 – Seal and pressure warning screw details

WARNING

Never put the Bandlock™2 Closure into service without the locking plate and pressure warning screw being fitted

2.0 INITIAL INSTALLATION 初步安装

2.1 CLOSURE ORIENTATION 盲板方位

The GD Engineering horizontal Bandlock™2 Closure must be installed truly horizontal, ensuring that the drain groove (Fig.1.0) is located at the lowest position for right/left hand hinge orientation. Vessels which are required for inclined or declined installations (nominally 1° to 10° from the horizontal) should be accommodated with a mitred closure weld preparation. This leaves the closure horizontal whilst accounting for the nominal angle of the vessel.

卧式盲板必须完全水平安装，如果压力容器在 1 度到 10 度内倾斜安装，那么盲板坡口需要斜接保证盲板是水平的。

WARNING 警告

DO NOT INSTALL CLOSURES WHICH ARE NOT IN A TRULY HORIZONTAL POSITION
盲板不允许在非水平位置安装

IMPORTANT NOTE 重要提示:

Prior to commencement of initial installation and fabrication of the closure to any pressure vessel, it is vital that you refer to sections 2.4 and 2.5 of this manual which provides important details in respect of distortion and recommendations for closures that require post weld heat-treatment. 在开始装盲板前，请参加手册 2.4 和 2.5 部分，其中有关于变形和热处理的有关内容。

The Bandlock™2 Closure door must always be removed prior to welding the closure to a vessel. Reference should be made to section 2.2 of this manual - Instructions for Door Removal. 盲板和容器焊接前，门必须拆下，请参见 2.2 部分-如何拆门。

IMPORTANT NOTE 重要提示

If you are in any doubt about the installation, maintenance or operation of this equipment, please contact the GD Engineering Service Department. 任何疑问，请和 GD 售后服务部联系

TEL: +44 (0)1909 482323 email: gd@spx.com

2.2 CLOSURE DOOR REMOVAL 门的拆卸

When it is necessary during initial installation, vessel fabrication or routine maintenance, to remove the Bandlock™2 Closure door, the following procedure should be followed:
 在组装及维护如何需要拆卸门时，请遵守如下程序：

IMPORTANT NOTE 重要提示

The Bandlock™2 Closure door must always be removed prior to welding the closure to any pressure vessel. 盲板与筒体焊接时，门必须被拆掉

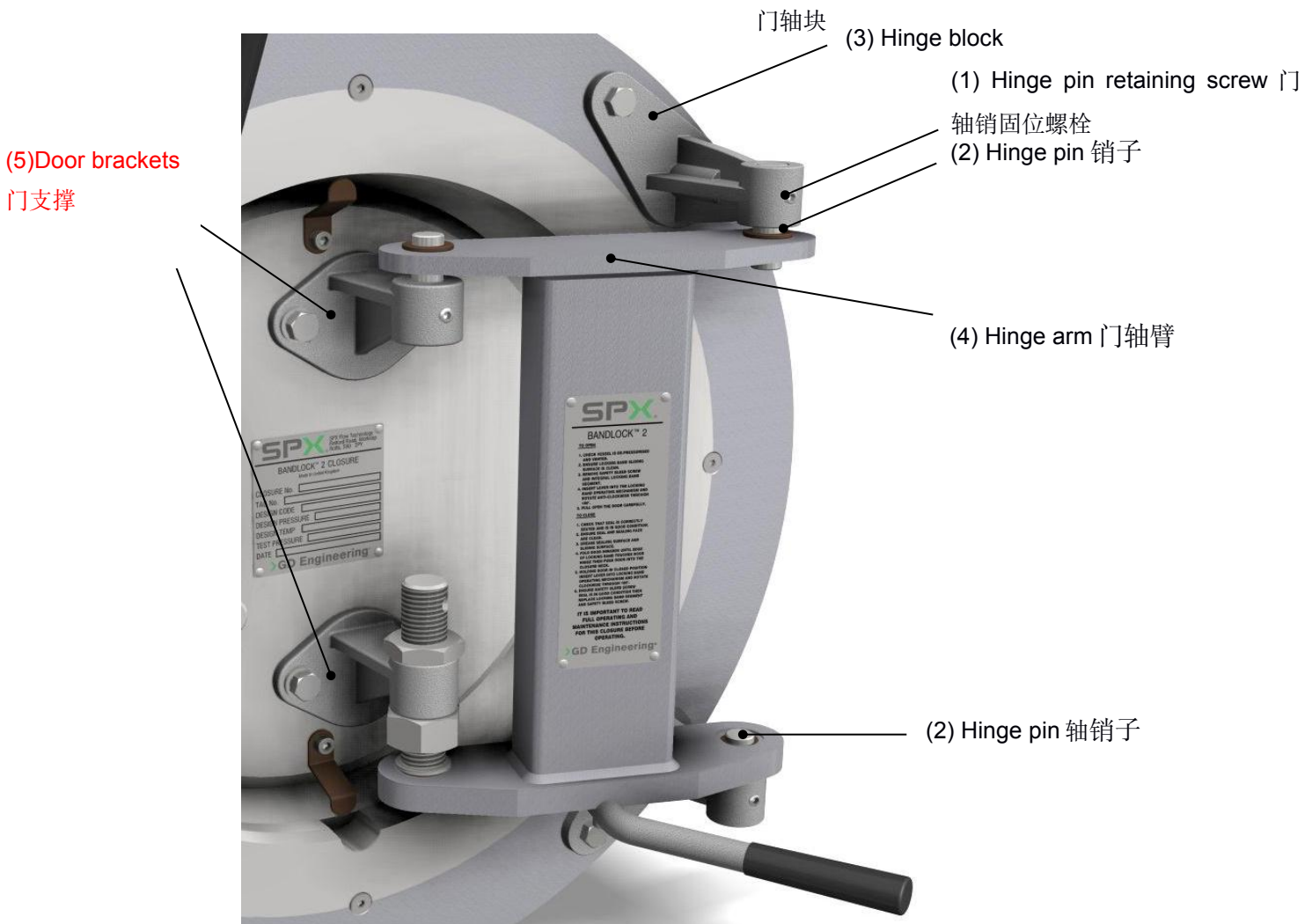


Fig 4.0 – Closure Door Removal / Re-installation (门拆除及重安装)

- 1 Remove the pressure warning screw and locking plate and contract the locking band to its 'door open' position (reference section 3.1 and 3.2 for unlocking and locking procedure).
拧下压力卸放螺栓，回缩锁带倒开的位置（参见 3.1 和 3.2）
- 2 Ensure that the Bandlock™ 2 Closure door is adequately supported in an approved sling (some larger doors may have a lifting eye provided for additional safety). Referring to Fig. 4.0, loosen the hinge pin retaining screw (item 1) and remove the hinge pin (item 2) connecting the hinge block (item 3) to hinge arm (item 4). 确保门被吊索足够支撑（大尺寸的门安装有吊眼），拧松上图的第一项-门轴销螺栓，第二项-销子。
- 3 It is now safe to remove the door from the closure. 现在门可以安全的离开盲板了。

IMPORTANT NOTE 重要提示

When storing the door it is important to always make sure that the seal and all machined surfaces are adequately protected from damage 当门在储存时，密封及所有机加工面要有足够保护避免损坏

On no account must the hinge block (item 3) or door bracket, (item 5), fasteners be removed when it is required to remove the closure door (i.e. for fabrication or painting). These have been factory set and should not require adjustment. In the event that these brackets have been removed, contact GD Service Department for further resetting instructions 在拆除门时，销轴块（第 3 项），门支撑（第 5 项）及紧固件，无需拆除。这些部件在工厂已经设定好。如果不小心拆除了，请和 GD 联系。

Ensure that the hinge pin bearings are fully protected from ingress of paint (reference section 2.6 for full instructions) 确保销轴轴承充分被保护，免于油漆进入。（见 2.6）

- 4 Strictly adhering to the above procedure will ensure ease of re-alignment of the closure door following installation.
严格按照上述程序，再安装门时不需要重新调整

2.3 HYDROSTATIC TESTING 水压试验

1. The closure must not be hydrostatically tested at a pressure greater than 1.5 x design pressure (stamped on the closure nameplate). Prior to performing the hydrostatic test, the seal must be removed and both the seal and sealing groove cleaned thoroughly and a thin layer of general purpose grease applied. 水压试验不能超所试验压力的 1.5 倍（在盲板铭牌上有标注），水压试验前，密封圈需要拆卸下来并彻底清理密封槽并涂抹量通用防锈油脂。
- 2 After Hydrostatic testing 水压试验后:
 - Ensure that closure internal surfaces, paying particular attention to the seal groove, are thoroughly dried and greased to prevent corrosion.
- 确保盲板密封圈，密封槽彻底干燥并涂抹适量防锈油脂避免腐蚀。
 - It is advisable to inspect the seal for damage. This is particularly important for closures with a design pressure of 425Barg (#2500) and above. The seal must be replaced if damaged.
- 请检查密封是否损坏。425BARG 或超过此压力的尤其重要，如果发现密封算换，必须更换。

2.4 DISTORTION 热处理变形

It is important that distortion due to fabrication, welding and subsequent post weld heat treatment (PWHT) is minimised. The following recommendations should be followed to minimise this risk:

把由于制造，焊接和随后热处理引起的变形的风险降低到最低非常重要，请遵守如下要求

- 1 Branch connections (in particular set-in type) should not be located within close proximity of the joining weld (not less than the nominal diameter (ID) of the branch, between the edges of the weld). 支管不能位于焊缝附近（两个焊缝的距离不能小于支管的直径）
- 2 The closure hub with the door removed should always be welded after the fabrication of the vessel branch connections. 支管制造焊接完毕后再焊接盲板法兰。
- 3 A minimum pre-heat temperature of 20°C should always be used, but this is dependent upon the welding parameters of the weld procedure qualification record utilised. 预热温度至少要 20 度，当然，这也取决于所采用的焊接程序的参数。
- 4 Automatic or semi-automatic processes should be used to maintain constant heat input. 采用全自动或半自动焊接工艺以保持持续的热输入。
- 5 A staggered welding sequence should be used when the manual metallic arc process is used. 当采用人工弧焊工艺时，请使用错列焊接工序。
- 6 On larger closures fitted with separate hinge retaining lugs, a lifting lug is provided to aid positioning for welding. This lifting lug must be removed after welding (Fig 5.0) 大型盲板会安装销轴定位耳，此提升耳在焊接后要除掉（图 5.0）

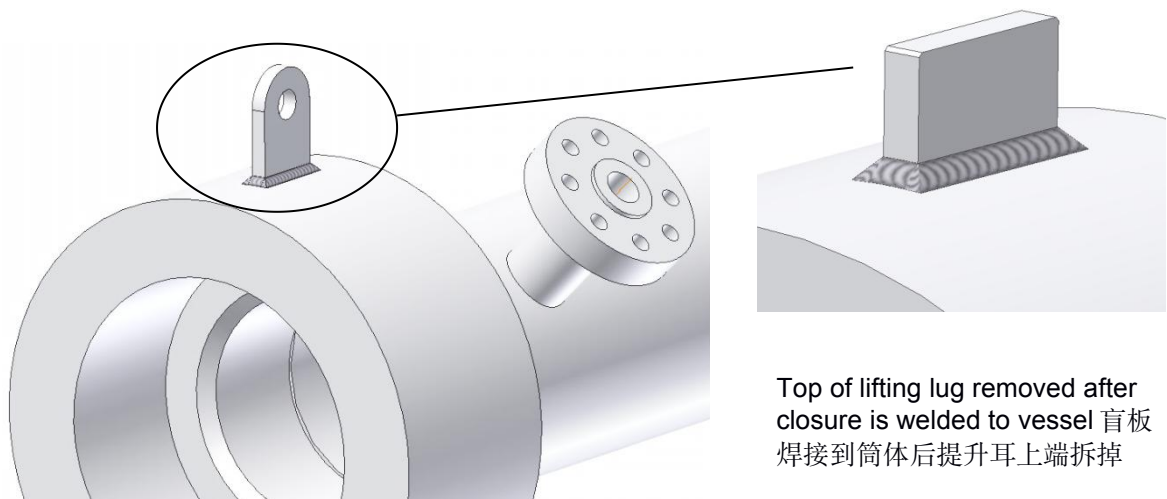


Fig 5.0 – Removal of Lifting Lug (提升耳的拆除)

WARNING 警告

ON NO ACCOUNT SHOULD THIS LIFTING LUG BE USED AS A LIFTING LUG FOR THE ATTACHED VESSEL. 此提升耳不能用于筒体的提升

2.5 PWHT RECOMMENDATIONS 热处理建议:

- 1 When storing the door, it is important to always make sure that the machined surfaces are adequately protected from damage. 储存盲板门时, 请保护密封面, 免受损坏
- 2 PWHT should be carried out generally in accordance with ASME VIII.
请按照 ASME VIII 要求完成热处理。
- 3 After PWHT, lightly emery cloth (smooth finish paper) the closure hub sealing face to remove any deposit build up.
热处理之后, 请用细砂纸除去密封面脏物。
- 4 **Note:** do not place any loads on the hinge mounting plate during or after the PWHT process.
热处理期间和之后, 切勿让门轴安装盘负重。

IMPORTANT NOTE 重要提示

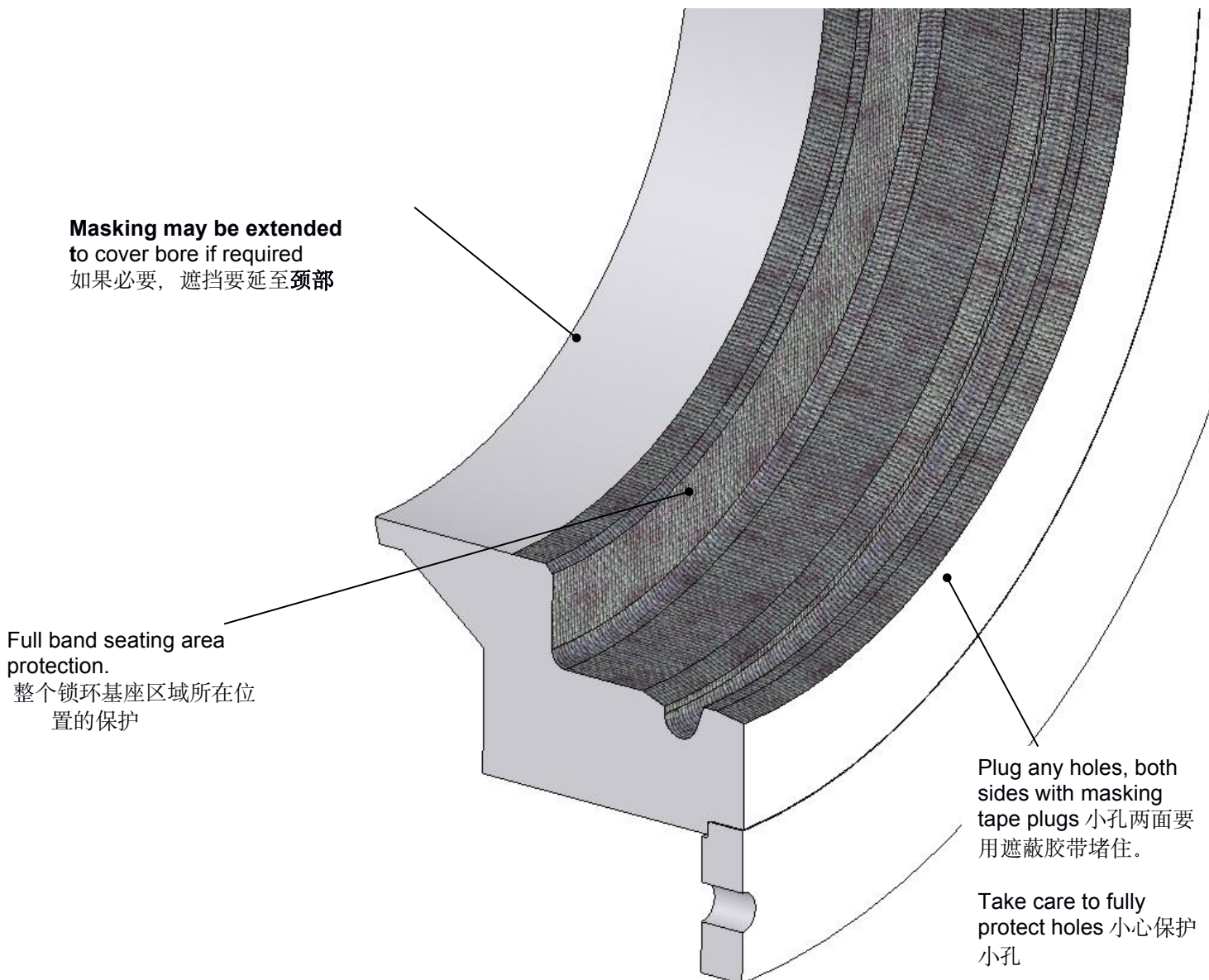
The closure door, seal and locking band assembly must always be removed before any welding is carried out 盲板门, 密封及锁环总成在焊接工作完成之前必须拆除

2.6 MASKING PROCEDURE FOR PAINTING THE BANDLOCK™2 CLOSURE

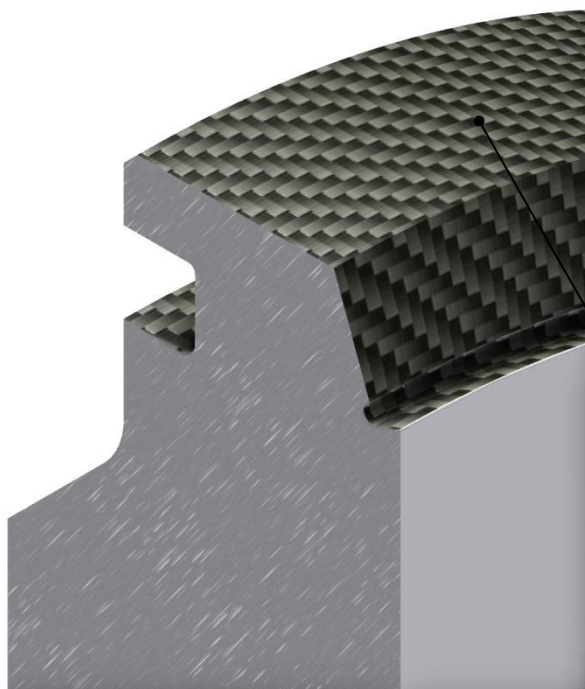
喷漆时的遮挡程序

- 1 When painting is required the areas shown "masked" should not be painted but protected with a blast proof masking material.
当喷漆时，如下标有“MASKED”的区域不能喷，需要用抗喷砂遮挡材料保护。
- 2 To prepare the closure for painting the locking band, pressure warning screw assembly and seal must be removed from the door. (The locking band and pressure warning screw assembly are stainless steel and do not require painting).
喷漆前，锁环，压力泄放螺栓，密封必须卸下（他们是不锈钢材质，不需要喷漆）
- 3 Closure door hinge bearings and all threaded holes must be suitably protected from ingress of shot blast and paint material.

门轴轴承和所有带螺纹的孔必须进行保护避免喷沙和漆进入。

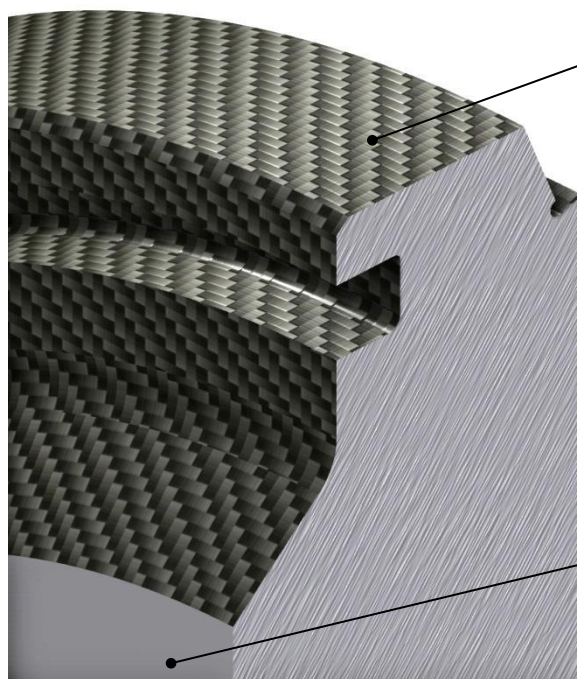


MASKING PROCEDURE Continued 遮蔽程序续...



Apply masking tape to areas indicated.

遮挡胶带的应用区域
Ensure all edges are secure for shot blasting.
确保所有边缘不受喷沙的影响



Optional full protection of pressure side of door if required
门里受压部分可以选择是否被保护

Fig 7.0 - Door Masking Area (门遮挡区域图)

IMPORTANT NOTE 重要提示

When painting the door the hinge bearings and all threaded holes must be protected from shot blast and paint 当喷涂门时，要保护销轴轴承及所有螺纹孔免受喷砂和喷涂。

2.7 CLOSURE DOOR RE-INSTALLATION 门的再安装

您需要重新安装门时，请遵循如下程序：

When ready to re-install the Bandlock™2 Closure door following initial installation, vessel fabrication or routine maintenance, the following procedure should be followed:

- 1 Ensure that the closure door is adequately supported in an approved sling (some larger Bandlock doors may have a lifting eye bolt provided). Refit the hinge pins (Fig 4.0 item 2) and tighten their retaining screws (Fig 4.0 item 1).
确保门被支撑（吊住），（一些大尺寸的门装有提升耳），安装轴销（图 4.0 第 2 项），拧紧螺栓。
- 2 It is important that the door height is checked immediately after re-installation of the door (reference section 2.8 - Door Vertical Height Adjustment).
安装门后需要立即检查门是否居中（参见 2.8-门垂直高度的调节）
- 3 Ensure that all machined surfaces are corrosion protected (reference section 4.3 - Maintenance).
确保所有密封面要进行防腐保护（见 4.3 部分-维护）
- 4 Expand the locking band to its locked position; refit the locking segment and pressure warning screw.
扩张锁带到锁定位，安装泄放螺栓总成
- 5 Strictly adhering to the above procedure will ensure ease of re-alignment of the closure door following installation. However, particular attention should be paid to section 2.8 of this manual – Door Vertical Height Adjustment.
严格按照上述程序可以确保门很容易调整。如果门不居中，请参见 2.8-门居中部分

IMPORTANT NOTE 重要提示

During re-installation kindly reference section 4.2 – Torque Settings (在重新安装时，请参见 4.2 部分-扭矩设定)

2.8 DOOR VERTICAL HEIGHT ADJUSTMENT (门垂直高度调节) :

- 1 Remove seal (reference section 4.1) and Pressure Warning Screw assembly.
取下密封 (见 4.1 部分) 及泄压螺栓总成
2. With the door open, contract locking band and close the door.
门在打开的状态, 回缩锁环然后关闭门
- 3 Check the gap between the hub and door in 12 o'clock and 6 o'clock positions (Fig 8.0) using feeler gauges.
见图 8.0, 检查门和颈部在 12 点及 6 点位置的缝隙。
- 4 Adjust gaps using adjuster screw (Fig 1.0) until gap at top and bottom is equal.
见图 1.0, 利用调节螺母调节缝隙直到顶部和底部缝隙相同
- 5 Section 4.4 can be completed to record this activity.
4.4 部分可以完整记录此项工作
- 6 The seal should be inspected before returning to the seal groove. If there are any cuts, cracks, abrasions, bubbling or the sealing lip has lost its flare, then the seal should be replaced.重新装回密封时, 请仔细检查, 如果发现有任何裂口, 磨损, 鼓泡或老化, 密封必须更换。
- 7 Ensure that all machined surfaces are clean and lubricated with general purpose grease before re-assembly.组装前, 确保机加工密封面干净并用通用油脂润滑。

NOTE 提示

Sideways adjustment of the door is factory set and should not require site re-adjustment. If for any reason the door brackets have been moved, contact the GD Service department for further re-setting instructions.侧向调节是在 GD 工厂设定的, 在现场不需要重新调整, 如果由于某种原因需要调整, 请和 GD 联系

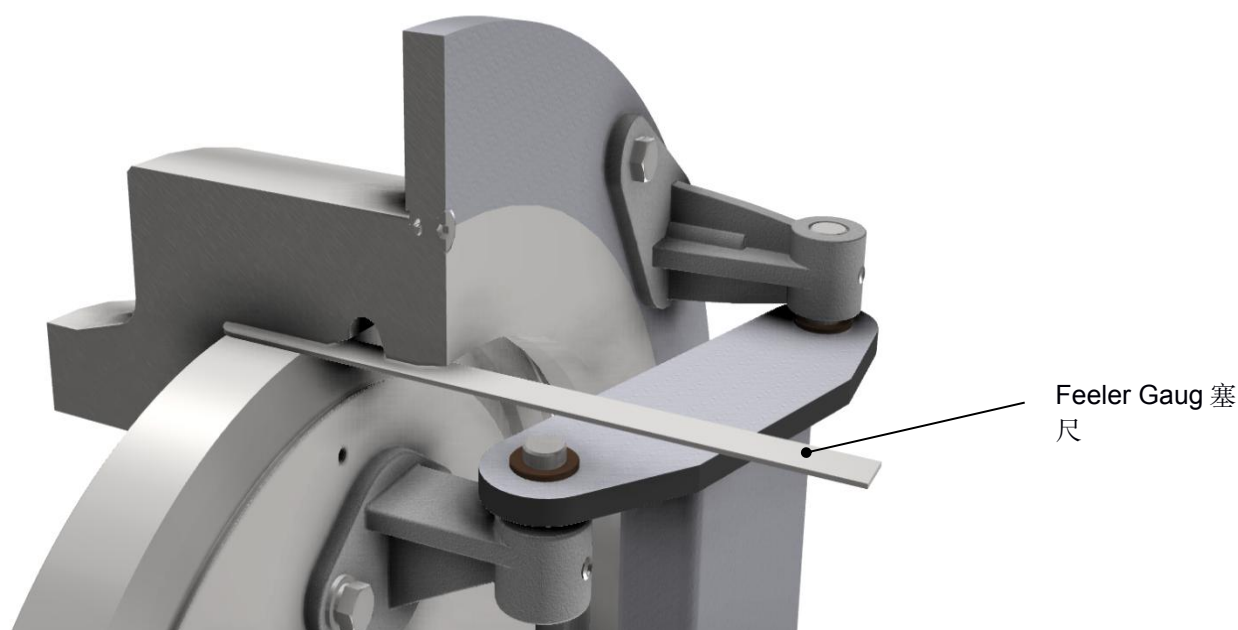


Fig 8.0 – Door Centralisation (门的居中)

3.0 BANDLOCK™2 OPERATION 操作

3.1 DOOR UNLOCKING AND OPENING 门的开启

- 1 Before attempting to open the closure, check that the vessel isolating procedures have been fully adhered too. Ensure the vessel is fully drained, vented and isolated from any pressure source. 试图开门之前，保证完全遵照操作程序，容器已被放空以及排污
- 2 Slacken off the pressure warning screw without attempting to remove it, any residual pressure in the vessel will be indicated when vented through the milled groove cut in the pressure warning screw threads. Should an indication be given, re-check the status of all valve isolations. 拧松压力卸放螺栓，如有残压，会通过螺栓槽指示。如果判定有残压，把螺栓再拧回，重新检查放阀及排污阀状态并等待
- 3 When completely satisfied that the closure is safe to open, remove the pressure warning screw and its integral locking plate (reference Fig. 3.0) from the closure.
当判定无残压后，盲板可以安全开启，参见 3.0 图，先将卸压螺栓总成取下。

Note: A slight rocking movement is required after the bolt has cleared the threads to enable the band locking segment to move from its seating. 注：螺栓离开螺扣后，轻微晃动螺栓，可以使锁环的小段离开锁槽。

- 4 Locate the universal handle into the drive link (reference Fig. 2.0) attached to the locking mechanism. Make sure that the universal handle is positively located in the hole provided. Rotate the universal handle anti-clockwise through approximately 180°. This will actuate the drive link and horseshoe mechanism and progressively contract the band onto the door recess. The universal handle should then be removed.
把万向手柄插入驱动连接中（参见图 2.0），反时针方向旋转手柄 180 度，锁环回缩，离开锁槽，挂到门上。

WARNING 警告

DO NOT allow the band to 'snap' into position. Owing to the natural spring of the locking band it is necessary to retain a firm grip on the universal handle during the unlocking / locking sequence of operation. Operators must not place their hand on or near the locking band mechanism. 不要使锁环突然到位，在操作中，由于锁环本身的弹性，请保持稳固的力量，控制好手柄

Keep full control of the handles radial movement to achieve a steady expansion or contraction of the band. Failure to adhere to the correct operation could cause the handle to be propelled from the drive link assembly during normal operational use 在整个半径运动操作中，始终控制手柄，确保锁环持续稳定的扩张或回缩

- 5 Insert the universal handle into the bottom of the hinge assembly in the location hole provided and swing the door open. 把万向手柄插入门轴下部孔内，旋转开门
- 6 The door is mounted on a double pivot mechanism, which gives a degree of straight-line movement and allows the door to be rotated for access to seal and band. 门安装在一个双支点机械装置上，可以使门在直线上移动

MAINTENANCE NOTE 重要提示

The Bandlock™2 Closure **MUST** always have sealing faces and machined areas of the closure hub and door protected by application of general purpose grease immediately after opening - even short periods left unprotected will result in sealing and machined faces becoming corroded or pitted. Immediate adequate protection is the best way of gaining prolonged service life. GD 盲板密封面及机加工面务必在开启后涂抹通用油脂进行保护-即使短时间不做保护也会发生锈蚀。及时足够的保护是延长产品寿命的最佳方法。

3.2 DOOR CLOSING AND LOCKING 门的关闭和锁定

Prior to Closing and Locking out the Door: 关门之前

- 1 Ensure that the rust preventative coating on sealing and machined surfaces that may have become contaminated with product or corrosion deposits is fully removed and the surface areas wiped clean. 确保密封面和机加工面上的锈蚀或脏物已经被清除并且表面用干净的布擦干净。
- 2 Ensure that the door seal is inspected for material splits, tears, blisters or any chemical damage or degradation. 检查密封是否有裂口，鼓包或化学损伤或老化
- 3 Ensure that the primary seal groove in the door is clean and free from debris. 确保密封槽干净没有锈蚀
- 4 Lightly smear seal and mating faces with a thin film of general purpose grease for corrosion protection. 在密封槽，对接密封面上，轻轻涂抹薄薄一层油脂。
- 5 Ensure that the locking band is fully contracted onto the door shoulder. 确保锁带以全部回缩在门肩上。
- 6 Swing the door inwards until the hinge side of the band is touching the hinge and then align the door by means of the universal handle so that the door enters squarely into the closure hub. 向内旋转门，直到锁带的门轴方接触的门轴，然后用万向手柄调节门，使门和盲板颈部平行。
- 7 Using the universal handle and applying an inward force on the door, compress the seal, which allows clearance between the band and hub face. Having located the universal handle (reference Fig. 2.0) in the drive link, rotate this in a clockwise direction until the locking band expands into the hub recess. The locking mechanism is designed to give 'over-centre' locking. 把一只手放在门中间，另一只手操作万向手柄，用一定的力将门推进，这个力可以压缩密封，消除锁带和颈部面之间的缝隙。参见图 2.0,把万向手柄插入驱动连接中，顺时针旋转手柄将锁带扩张进锁槽

WARNING 警告

DO NOT allow the band to 'snap' into position. Owing to the natural spring of the locking band it is necessary to retain a firm grip on the universal handle during the unlocking / locking sequence of operation. Operators must not place their hand on or near the locking band mechanism. 不要使锁环突然到位，在操作中，由于锁环本身的弹性，请保持稳固的力量，控制好手柄

Keep full control of the handles radial movement to achieve a steady expansion or contraction of the band. Failure to adhere to the correct operation could cause the handle to be propelled from the drive link assembly during normal operational use. 在整个半径运动操作中，始终控制手柄，确保锁环持续稳定的扩张或回缩

- 8 The locking segment can now be refitted; on no account should this plate be forced or altered to fit - if proper fitting cannot be achieved then the locking band or seal is not properly located. Check that all surfaces are clean and corrosion free. Adjust if necessary only after thorough cleaning. 现在该安装锁环的小段，它很容易安装，切勿用力或改变什么来安装-如果安装时觉得费力，说明锁环或密封安装可能不道位，请检查，另外检查所有表面是干净无锈蚀的。
- 9 Screw home the pressure warning screw containing the metal bonded seal and tighten (reference section 4.2 Torque Setting). 拧好卸放螺栓。切记要用手垂直拧入，不能倾斜拧入，不能用工具拧，否则会损坏螺扣。

3.3 STORAGE 储存

Bandlock™2 Closure:

If it is necessary to store the closure / vessel (even for a short period of time) it is strongly recommended to generously coat the closure hub, sealing face and all internal machined areas with 'Waxoyl' or other similar protective substance. Remove the seal from the closure door and again liberally coat all machined areas. Refit the door seal to prevent ingress of dirt. You should also consider the use of desiccant bags in the vessel to prevent moisture build-up. 如果盲板需要储存（即使很短的时间），也务必对颈部，密封面，内部机加工面涂抹防锈油（WAXOYL）或者相当的油品。把密封卸下，涂抹机加工面，重新安装密封以阻止脏东西侵入。也应考虑使用带干燥剂的袋子防止潮气。

Following storage and prior to refitting the seal, remove protective finish in seal groove and seal faces and re-apply a thin layer of general purpose grease. 储存后安装密封之前，除掉密封槽，密封面上的保护涂层，安装后重新涂抹油脂。

Rubber Products (seals) Shelf Life 橡胶产品（密封）储存寿命:

Material 材质	Primary Storage Period Years 初步储存储存期限	Extended Period (after re-inspection) Years 延长期限（重新检查后）
HNBR	3	1
Nitrile	3	1
Viton	5	2

Seal Storage Conditions 密封 储存条件

Temperature 温度

Storage temperatures should not exceed 25°C. Lower temperatures are not permanently harmful to rubbers. 储存温度不要超过 25 度，低温对橡胶影响不大。

Light 光

Rubber products (seals) should be protected from direct sunlight and strong artificial light with ultraviolet content, preferably by packing in an opaque container or by screening storage areas away from harmful ultraviolet rays. 避免阳光直射和强的带紫外线的光源的照射，最好放置在不透明的容器中保存。

Oxygen and Ozone 氧气和臭氧

Wherever possible rubber products should be protected from circulating air by wrapping, storage in airtight containers or other suitable means. 橡胶产品请尽可能地包装保存好，避免空气流通。

Deformation 变形

Rubber products should be stored in a relaxed condition, free from tension, compression or other deformation. Seals must not be hung from single point supports likely to produce deformation of the seal shape. 橡胶产品应保存在宽松的环境中，避免挤压或其他使其变形的方式。密封不能用一点悬挂保存，这会导致变形。

4.0 LOCKING BAND MECHANISM ADJUSTMENT 锁环机械装置的调整

Should it become difficult to engage the locking band, segment or pressure warning screw, it may be necessary to adjust the locking band. 如果操作锁环或压力泄放螺栓比较困难，那需要调整锁带。

- 1 Expand the locking band outwards to its fully 'locked' position and fit the locking segment incorporating pressure warning screw. Both the band and locking segment should engage easily allowing the pressure warning screw to be hand tightened. If difficulties are experienced in hand tightening the pressure warning screw, the following procedure should be adhered to. 把锁环向外扩张致完全锁定的位置，然后安装锁环的小段及卸压螺栓总成。锁环的小段和螺栓应该很容易用手拧到位，如果觉得不容易，请遵循如下调整程序：
- 2 Adjust each eccentric stop (Fig 2.0) such that it provides a running fit for the locking band lug (Fig 2.0) between the adjusted eccentric stop and the fixed position of support screw. 调整偏心止动（图 2.0），它为可调节的偏心止动和支撑螺母固定位置之间的锁环耳提供了转动配合
- 3 Secure the eccentric stop by tightening hexagon socket countersunk head screw. 通过拧紧六角螺冒来弄牢偏心止动。
- 4 Re-check band operation by expanding and contracting locking band (with segment/locking plate removed). Adjust as necessary using steps 1 to 3 above. 再回缩和扩张锁环检查操作。如果需要，在用上述步骤调整。

NOTE 提示:

It is advised, before final adjustment to lightly smear the locking band internal and external sliding faces with a thin film of general purpose grease 最终调整前，请对锁环里面和外部滑行面涂抹油脂

4.1 SEAL REPLACEMENT 密封的更换

Should it be necessary to remove the door seal from the closure, this can be achieved simply by prising the seal out of the groove with a flat bladed tool under the seal lip, making sure the seal and the seal groove is not damaged. 假如需要拆卸密封，请用扁平的工具把密封取出，请确保密封和密封槽不被损坏。

- 1 With the seal removed, the seal groove should be wiped clean of all loose impediments and corrosion deposits. A thin layer of general purpose grease should be applied to the seal groove prior to replacing the seal. 取下密封后，请用细砂纸和布把槽和密封面上的锈蚀及脏物弄干净，然后抹一层油脂（建议用硅油），再将新密封安装。
- 2 To refit the seal, present the seal to the groove with the energised lip of the seal protruding outwards (reference Fig. 9.0) and press the seal into the door seal groove at the top (12 o'clock position). Then press the seal into the bottom 6 o'clock ensuring that the seal is central in the groove. The seal should then be fitted at the 3 o'clock and again at the 9 o'clock position before working the seal evenly into the door seal groove. 安装密封时，请注意不要装反，密封的唇要向外（见 9.0），用手先在 12 点位置将密封按进去，然后在 6 点位置按，接着在 3 点位置和 9 点位置，最后将其他部位按进去。
- 3 Following hydrostatic testing it is advisable to inspect the seal for damage. This is particularly important for closures with a design pressure of 425Barg (#2500) and above. The seal must be replaced if damaged.

NOTE 提示:

The seal is of predetermined length and must not be altered. If surplus seal seems evident it should be worked into the groove. Lubrication of the seal groove will assist in this operation and general seal replacement 密封的长度预先设定不能改变，假如安装时发现多出来，请按照 12.6.

3, 9点位置重新安装, 应该都安装进槽内。密封槽保持润滑有助于操作和密封的更换

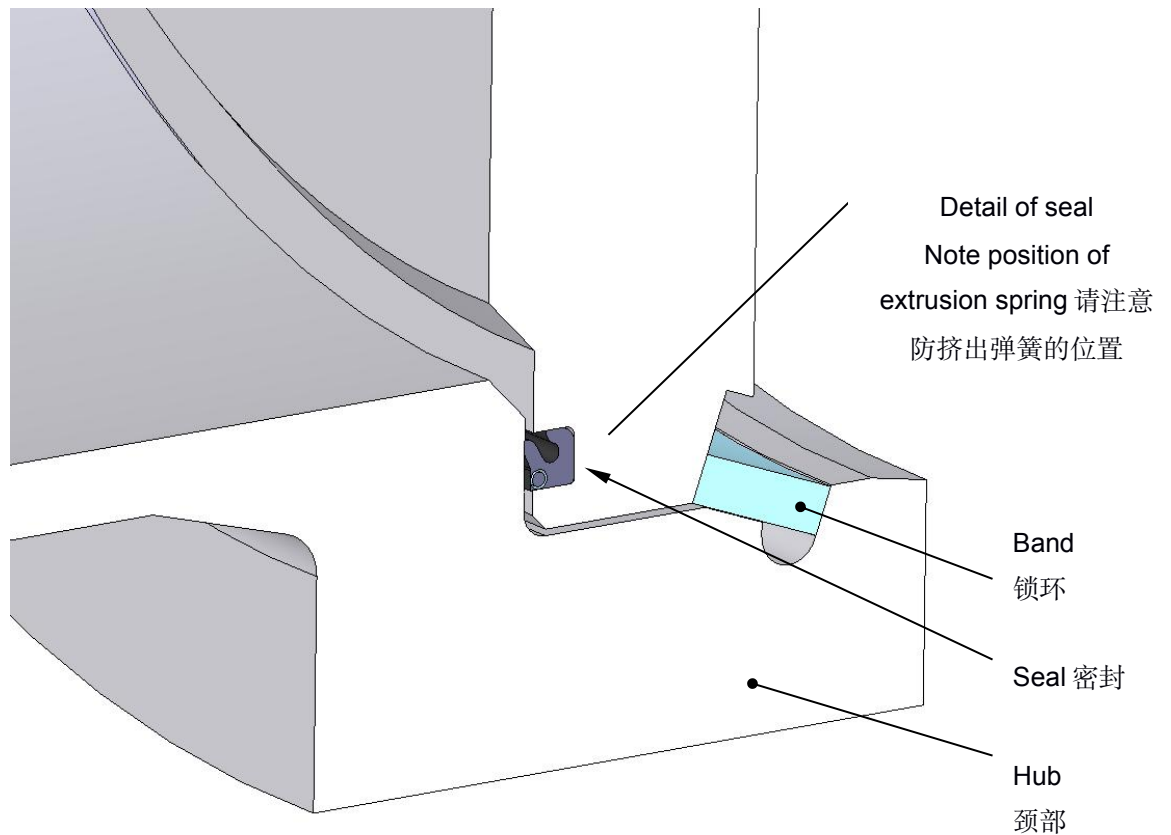


Fig 9.0 – Seal Detail (关于密封) .

DO NOT use sharp objects to assist in the removal of closure seals
This would result in further damage to the closure 不要用尖锐的东西试图取出密封, 这会导
致盲板的损坏

IMPORTANT NOTE 重要提示:
It is false economy to neglect the requirements for regular and thorough routine cleaning, checking and surface protection. Damage to the seal faces will cause leakage problems 千万
不要忽略日常的维护检查和密封面的保护, 密封面的损坏将导致泄漏
If you are in any doubt about the installation, maintenance or operation of this equipment, please contact the GD Engineering Service Department 如果有
任何安装, 维护和操作的疑问, 请和我们联系
TEL +44 (0)1909 482323 email: gd@spx.com

4.2 TORQUE SETTINGS 扭矩设定:

Recommended torque settings for the Bandlock™2 Closure, stainless steel door bolts and pressure warning screws 对盲板, 不锈钢螺栓及泄压螺栓的扭矩做如下建议: .

DOOR BOLTING 门螺栓

FASTENER SIZE 紧固件尺寸	TORQUE SETTINGS 扭矩设定 Nm / lbf.ft
M8	17 / 12.5
M10	33 / 24.3
M12	57/42
M16	85 / 62.7
M20	160 / 118
M24	250/184.4
M30	320/236

PRESSURE WARNING SCREW (PWS)泄压螺栓

PWS SIZE (螺栓尺寸)	RECOMMENDED TORQUE SETTINGS 建 议的扭矩值 Nm / lbf.ft.
M16	31 / 23
M24	74 / 54.6

4.3 MAINTENANCE ACTIVITY DETAILS 盲板的维护

In order to maintain the Bandlock™2 Closure in good working condition and to prevent operational difficulties, the following activities should be performed periodically as part of a routine maintenance schedule. 为保持盲板的好的服务状态，避免操作的困难，请定期做常规维护

MECHANICAL MAINTENANCE - BANDLOCK™2 CLOSURE

机械维护-BANDLOCK 2 盲板

4.3.1 Locking Band (reference Fig. 1.0) 锁环 (见图 1.0)

- a) Clean the locking band. 清洁锁环
- b) Check for any distortion within the band and the lugs to the band. Ensure that the retaining clips are correctly installed. 检查锁环及锁环耳有无变形，支撑夹是否正确安装。
- c) Lightly lubricate the locking band with general purpose grease. 用硅油或相当的油品润滑锁环

4.3.2 Door / Closure Hub (reference Fig. 3.0) 门/盲板颈部

- a) Check that the sealing surface of the door is clean and free from mechanical damage and corrosion, refurbish as necessary. 检查门的密封面是否干净并且没有机械损伤和锈蚀，如果需要，进行打磨。
- b) Check that the sliding surfaces of the door/band interface are clean and free from mechanical damage and corrosion, refurbish as necessary. 检查门和锁环接触面是否干净并没有锈蚀，如果需要，进行打磨。
- c) Visually inspect for thread wear and corrosion in the pressure warning screw hole. 眼睛检查泄压螺栓孔的螺扣是否完好，没有锈蚀
- d) Check for damage to the pressure warning screw seal face.
检查泄压螺栓密封面是否有损伤
- e) Check gap between the hub and the door in the top and bottom positions, (ref section 2.8). These gaps should be equal. 把锁环取下可检查门是否居中，0.2MM 以内的的变化是允许的 (参见 2.8 部分)
- f) Lightly lubricate the locking band groove and all machined surfaces with general purpose grease. 在密封槽和所有密封面涂抹一层薄薄的硅油或其他同类油品。

4.3.3 Pressure Warning Screw (reference Fig. 3.0) 压力卸放螺栓 (参见图 3.0)

- a) Check for thread wear, corrosion and straightness of the pressure warning screw and check the condition of the pressure warning screw seal and replace if necessary.
检查螺扣，锈蚀和螺栓的垂直。检查垫片，如果损坏，请更换。

4.3.4 Locking Mechanism (reference Fig. 2.0) 锁定机械装置 (参见图 2.0)

- a) Expand the locking band outwards to its 'locked' position and fit the locking segment and integral pressure warning screw. 扩张锁环到锁定位，安装一体的锁环的小段和泄压螺栓。
With the pressure warning screw in position, check that the gap between the ends of the locking band and segment are approximately 1/16" (1.5mm) each side. 安装到位后，检查锁环大段和小段之间的缝隙，两边应该约 1/16 "(1.5mm)
If it is necessary to reset the gap, adjust the two eccentric stops (reference Fig. 2.0) such that they make contact with the edges of the locking band lugs whilst leaving a gap of approximately 1/16" (1.5mm) each side. 假如需要调整缝隙，可调节两个偏心止动 (参见图 2.0)
- b) Secure stops by tightening hexagon socket countersunk screws. 拧紧六角螺母使偏心止动牢固。

4.3.5 Hinges (reference Fig. 1.0) 门轴 (参见图 1.0)

- a) Check the freedom of movement of the hinge pins and bearings. Check there is no excessive wear. 检查门轴销子和轴承移动的自由度, 检查是否过度磨损
- b) The grease nipple on the hinge bearings should be re-greased at the time of the general closure maintenance which the technicians set / perform.
门轴轴承上的注油嘴在每次维护或调整盲板时请润滑。

4.3.6 Seall 密封

- a) Check the condition of the door seal and replace if necessary ensuring that the seal is within its shelf life, as quoted on the seal packaging. 检查门密封, 必要时更换, 确保密封在寿命内。
- b) Lightly lubricate the seal and its mating faces with general purpose grease. 给密封面和密封槽涂抹硅油或相当油品防锈, 切勿涂抹太厚, 薄薄一层即可。

NOTE 提示:

Shelf life is specified as date to be used within, and then dependant of operational use, refer to section 3.3 – Storage 保存寿命规定了日期, 要求在此期间内投入使用, 见 3.3 部分-储存

4.3.7 Leak Testing 泄露检测

- a) Upon completion of all remedial work, and in accordance with client operational procedures we recommend that a leak and pressure test is performed to verify closure integrity.
完成各项检查工作后, 根据用户操作规程, 我们建议进行压力实验。

IMPORTANT NOTE 重要提示:

In order to protect product integrity no unauthorised modifications or alterations must be carried out without the prior approval of GD Engineering.
Any such modifications/alterations may affect the product warranty. 为保护产品的整体性能, 没有GD 公司批准, 不许进行产品的改变, 任何改变将影响 GD 对产品的质量保证。

4.4 MAINTENANCE SERVICE RECORD 维护记录

Closure Identification(盲板信息)

Serial No 系列号:Pressure Rating 压力:

Tag No 位号:Operational Site 操作地点:

Bandlock™ 2 and Pressure Warning Screw Seal Change Record 密封更换记录:

(Please tick relevant column)

Date: 日期	Door Seal 门密封 ✓	Pressure Warning Screw Seal 卸放螺栓垫片 ✓	By: 由:	Comment: 备注:

Vertical Height Adjustment Check: (Reference Fig. 2.8)垂直高度调节检查

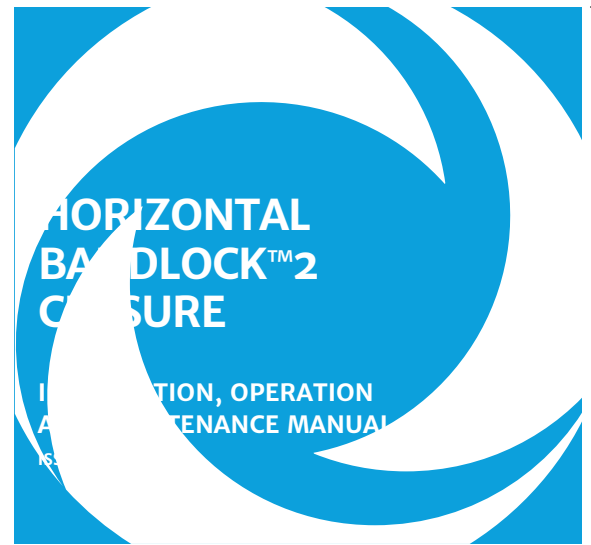
Date 日期:	By 由:	Comment 备注:

Corrosion Condition Check 锈蚀状况检查

Date 日期:	By 由:	Comment 备注:



| SPEED
| EXCELLENCE
| PARTNERSHIP



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Celeros Flow Technology reserves the right to incorporate our latest design and material changes without notice or obligation. Design features, materials of construction and dimensional data, as described in this bulletin, are provided for your information only and should not be relied upon unless confirmed in writing.

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