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最小間隙 機械式 法蘭撐開器 操作說明 **SMG-7TM**



中文：C1~C16

中文
English
Ver.16

1. 安全預防措施



不遵守以下的注意事項和警告將引起設備損失及人員傷害。



重要事項：未滿18歲人員不得擅自操作。操作SUN RUN油壓設備前請先仔細閱讀並了解相關操作手冊、安全事項和警告事項。操作人員負有油壓設備週邊之人員及環境之安全責任。



警告事項：為確保避免人員傷害和設備作業損失，請確認所有油壓設備及週邊配件，使用最大壓力為 700 bar(10,000psi)。



警告事項：操作人員於使用期間為避免傷害，需全程配戴安全防護措施。



危險事項：為避免人員傷害，請於操作過程中手、腳遠離液(油)油壓缸和液壓設備。



警告事項：系統操作壓力絕不可超過最低壓力元件之值最低值。系統中應加裝壓力錶藉以監測系統中的壓力並了解使用狀態。



警告事項：禁止超載使用。

超載使用易造成設備損害及人員損傷。液(油)壓缸設計最大使用壓力為 700 bar (10,000psi)。



危險事項：液(油)壓設備應遠離火或熱源。高溫會軟化包裝和密封材料，導致液壓油洩漏；高溫同時也會造成油管材質與包裝變質。為確保最好狀態，不要將液(油)壓設備暴露於 65°C(150°F)高溫。在電焊場所時亦應注意防止電焊火花噴到油管。



警告事項：請勿操作未潤滑的滑塊及4支滑動插銷。並使用較好的潤滑油。



警告事項：避免損壞油壓管。捲收油管時，避免油管強烈彎曲或打結。使用彎曲或打結油管易引起背壓。強烈彎曲或打結的油管亦易引起內部損壞或提早油管老化。



重要事項：液壓設備必需由合格的液壓技工進行維修。需要修理時，請連繫就近的SUN RUN服務據點並使用SUN RUN 液壓油保固方為有效。



危險事項：不要用手對油管施加壓力(包括拉或舉高) 高壓下洩漏的液壓油會穿透皮膚造成嚴重傷害。當液壓油侵入皮膚請立即就診。



警告事項：液(油)壓缸只能在已連接好的液壓油路中使用；快速接頭尚未確實連接時禁止使用或加壓，否則高壓情況下接頭的油封及鋼珠會高速噴出造成人員傷亡。



重要事項：千萬不要利用油管來提攜其他油壓設備(例如:小型油壓缸、泵浦..等)



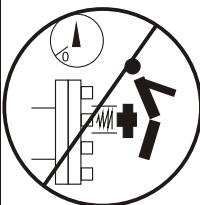
警告事項：除了墊塊，千萬不可以手指置於動作中的撐開器。



警告事項：撐開器的把手是用來當撐開器回縮時使使用者不直接握住撐開器。可使手指免於卡在二片夾片中。



危險事項：千萬不要使用榔頭或其他楔型斧撐開夾縫。



切勿在拉伸或拆卸過程中站立於螺栓同軸位置。如果螺栓出現問題、鬆脫或損壞的零件可能會射出，如此可能會導致嚴重的人員傷亡。非必要或壓力穩定情況下，才允許操作者到加壓拉伸器附近持續觀察壓力計。

2. 規範

SUN RUN SMG-7TM為最小間隙法蘭撐開器，有易於安全操作法蘭面。

唯一能用於間隙 2 mm 的法蘭面。

當操作在正確撐開點時，其撐開力亦同最大。

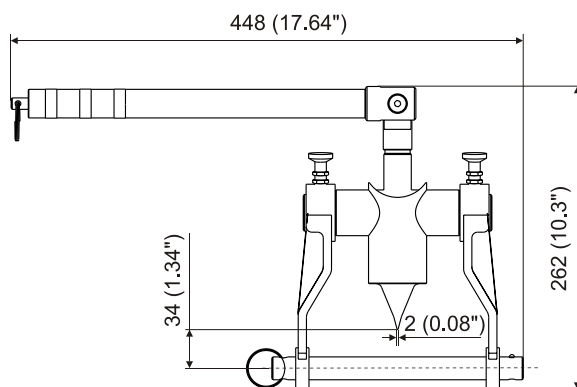
操作時請閱讀相關操作說明，以確保工件和操作人員安全。

- 安全可用度高。
- 可提供 6.8噸撐開力。
- 最小撐開間隙2 mm。
- 輕巧且易於使用。

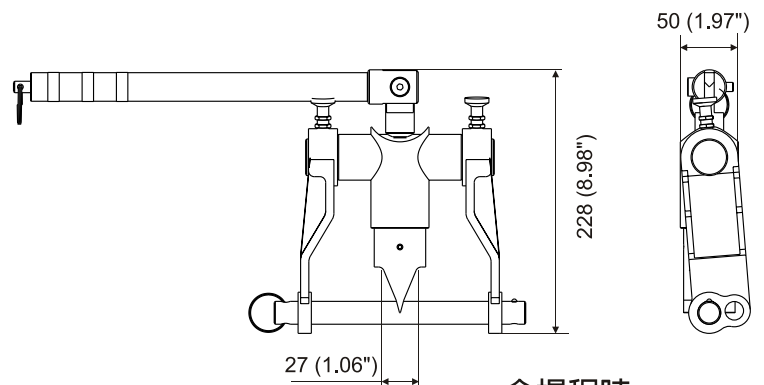
2.1 重量&尺寸

總重: 5.5KG

最大撐開桿 $\phi 20\text{ mm}$ (0.79") in mm (inch)

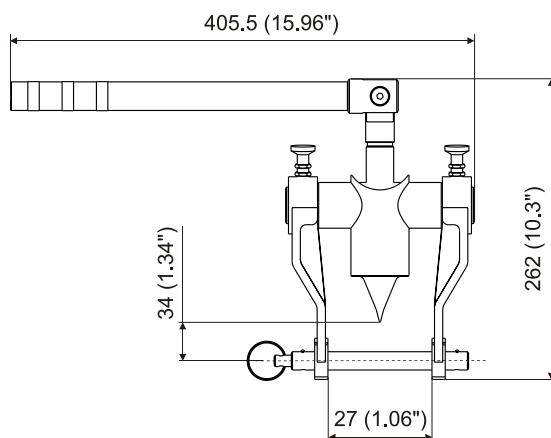


未楊程時

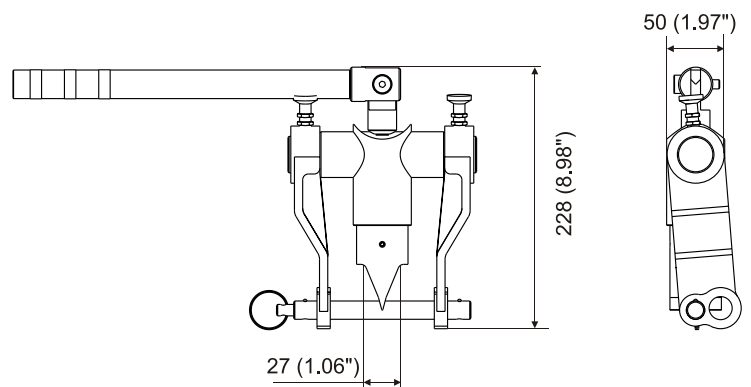


全楊程時

最小撐開桿 $\phi 16\text{ mm}$ (0.63") in mm (inch)



未楊程時

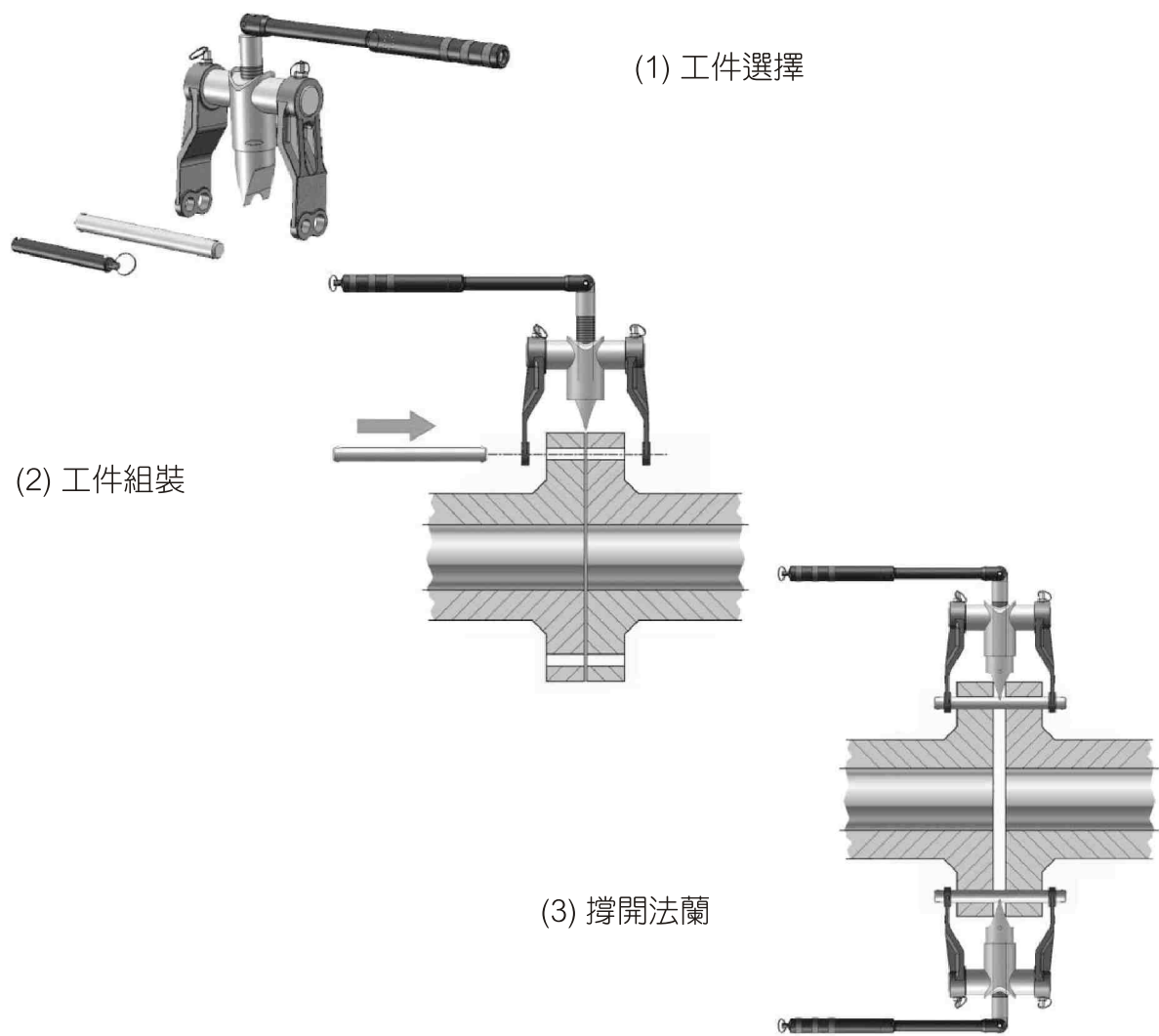


全楊程時

2. 規範

型號 Model Number	能力 Capacity	撐開距離 Spreading distance	重量 Wt.	適用範圍 Range of application											
				BS10 Flanges		ASME B16.47 Flanges (含焊頸及盲邊): (Including weld neck and blind flange):		ASME B16.5 Flanges (焊頸): (weld neck):		ASME B16.5 Flanges (焊槽): (Socket welded):		ANSI reducing application Flanges (含牙及滑道): (Including threaded and slip on flange):		ANSI orifice application Flanges (含焊頸,牙及滑道): (Including weld neck, thread and slip on flange):	
				等級	範圍	等級	範圍	等級	範圍	等級	範圍	等級	範圍	等級	範圍
				Class	Range	Class	Range	Class	Range	Class	Range	Class	Range	Class	Range
SMG-7TM	68/ 7	2.0-27.0	11.5	H	0.5~24"	150	26~60"	150	2~48"	150	2~3"	150	2~48"	300	1~20"
				J	0.5~24"	300	26~60"	300	3/4~48"	300	3/4~3"	300	3/4~48"		
				K	0.5~20"										
				R	0.5~20"										
				S	0.5~16"										
				T	0.5~13"										

撐開間隙 2-27 mm。
當撐開至間隙為7mm 時，撐開力為 6.8 tons 變為 3.9 tons。

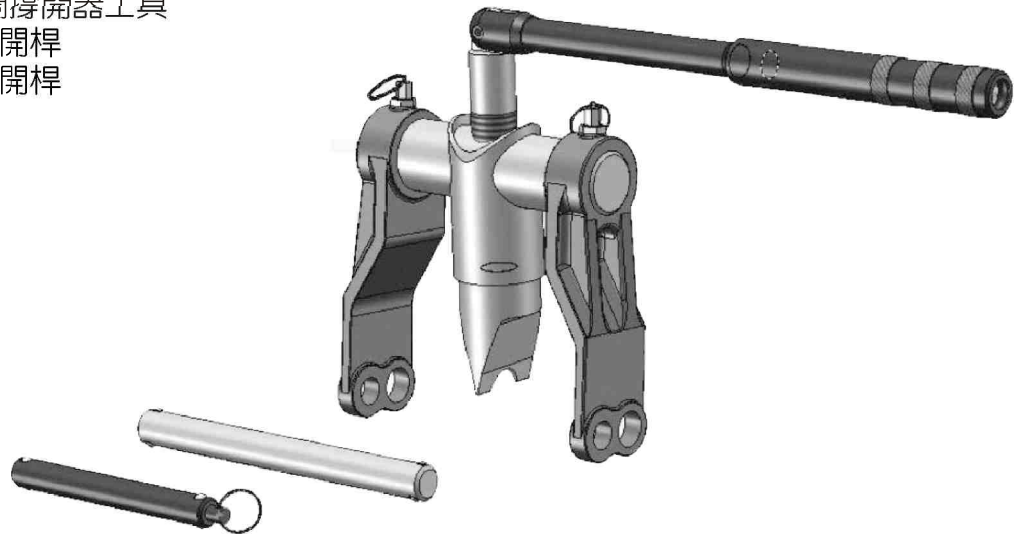


操作者必須熟讀操作說明

3. 設備清單

SMG-7TM 設備包含:

- 1* SMG-7TM 最小間隙法蘭撐開器工具
- 1* 直徑 ϕ 16 mm (0.63") 撐開桿
- 1* 直徑 ϕ 20 mm (0.79") 撐開桿
- 1* 操作說明手冊



4. 功能和操作



在裝上撐開器之前，確認法蘭上至少有兩個螺栓是呈180度，且螺帽鬆度是夠讓法蘭撐開的距離。

當法蘭撐開時，這些螺栓可支撐住法蘭，讓其不易完全撐開而掉落。



不要延長把手或將 直徑 ϕ 16 mm 撐開桿當成延長桿。

注意勿破壞法蘭結墊片。

為確保相關任何風險評估，在執行工作時並確實按照此操作程序進行。

4. 功能和操作

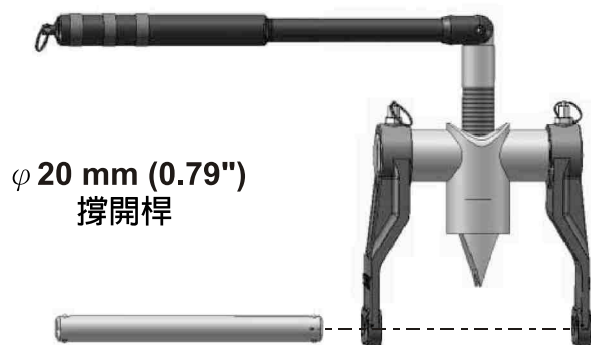


圖 1.

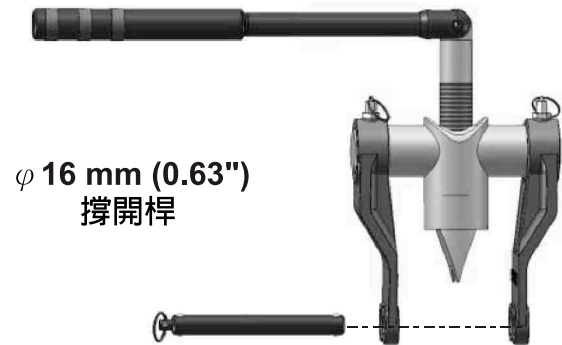


圖 2.

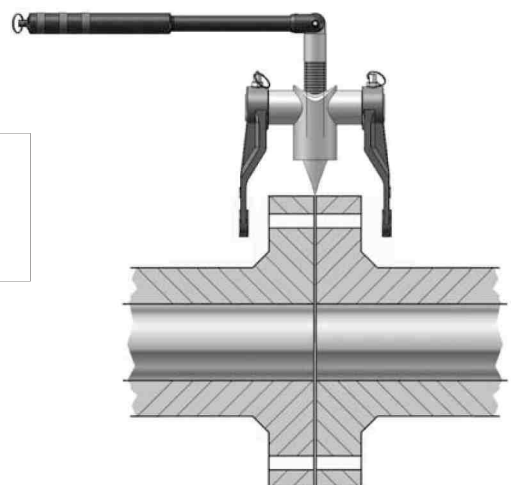
4.2 此手冊後面附有法蘭等級表格，依上面的圖片選擇適當的大小，和法蘭結的等級。

撐開桿只允許依需求放入一支，不可同時將兩支撐開桿放入工件中。



依每家公司程序和風險，評估法蘭上的螺栓拆卸與否。

4.3 將工件放置法蘭結的上方且將工件上放撐開器的孔對準其螺栓孔。

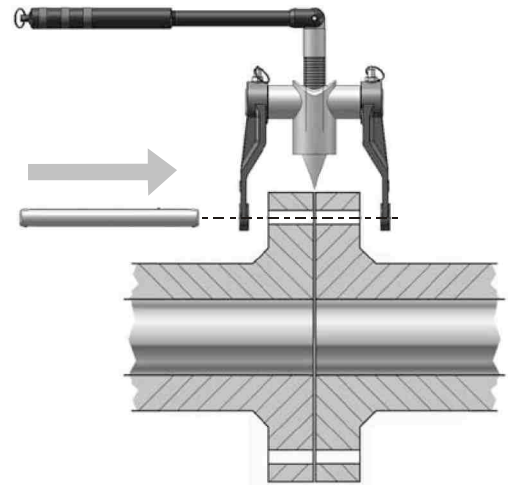


4. 功能和操作

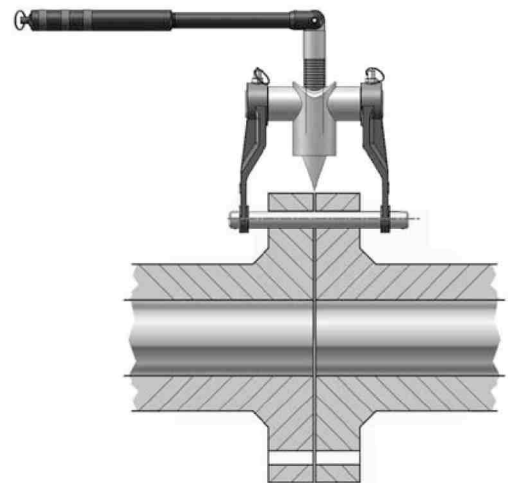
4.4 將撐開桿同時穿過工件腳座的孔和螺栓孔。



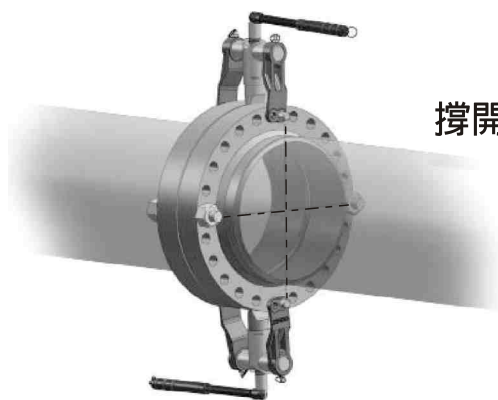
不要猛力敲擊或過度用力。
應適當人力置入即可。



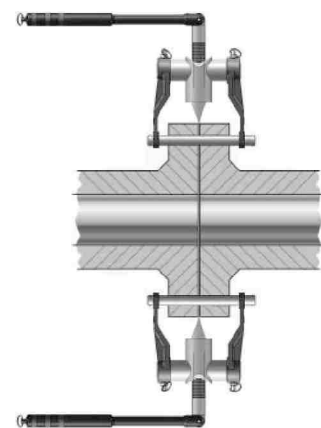
4.5 小心注意撐開桿是否正確穿過工件的第二個腳座孔，並檢查撐開楔的位置為法蘭面間隙。



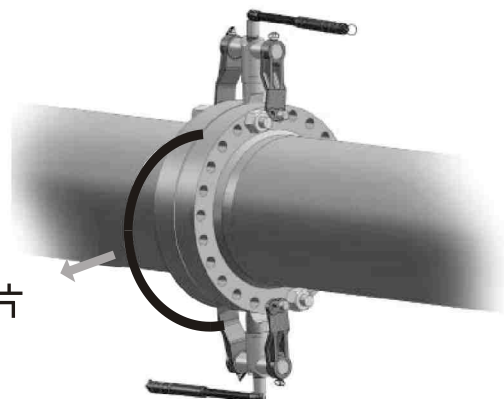
4.6 同時使用兩個撐開器工件且為相反兩側對工作作業有很大的幫助。



撐開法蘭



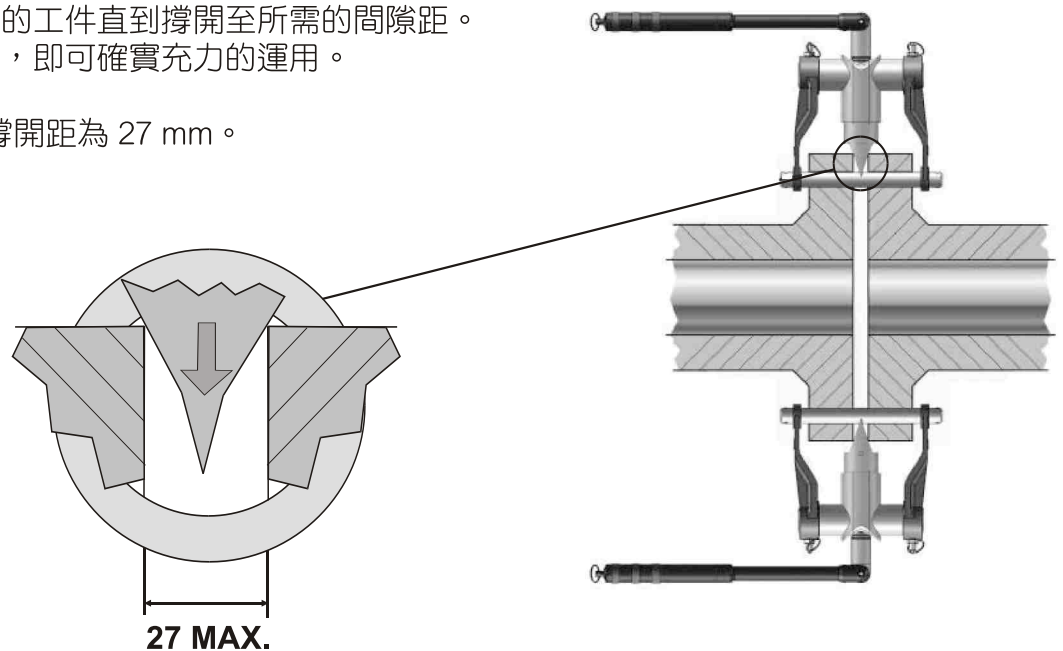
撐開法蘭
且移除墊片



4. 功能和操作

- 4.7 同時操作另一邊的工件直到撐開至所需的間隙距。
注意其使用力度，即可確實充力的運用。

SMG-7TM最大撐開距為 27 mm。

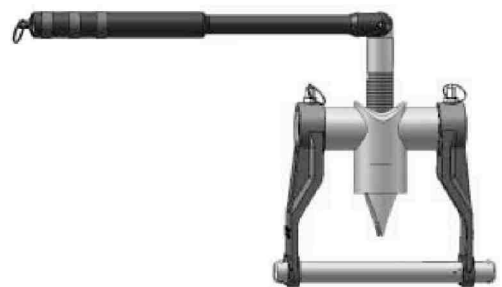


5. 維修和潤滑

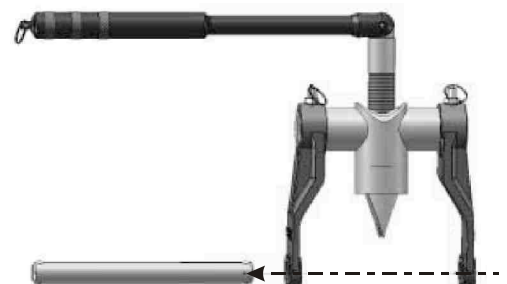
在每一次工作前後，都必須檢查所有零件的完整性，若有損壞應立即維修。

在每次正常使用下或特別是過於暴露於鹽水中，其工件應被拆除且添加潤滑劑，依以下的步驟：

- 5.1 將工件平躺於地板或平板上，右側方向面朝下。

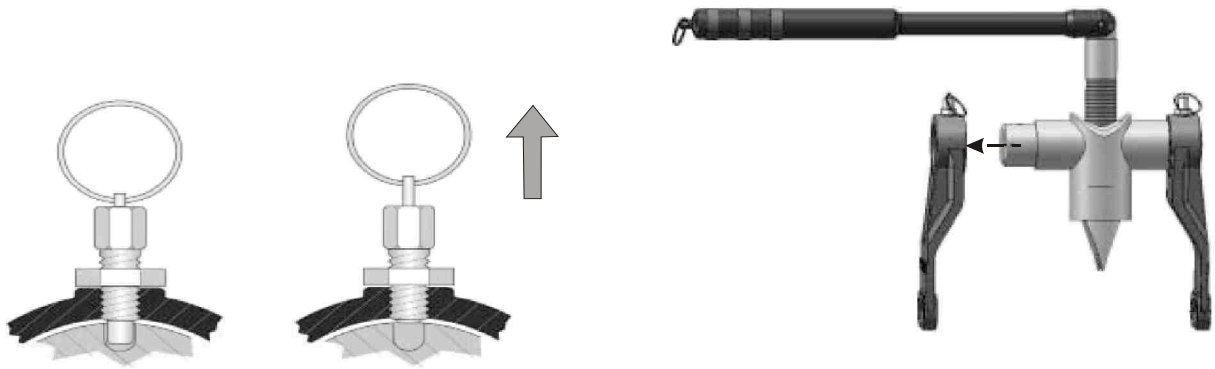


- 5.2 將撐開桿拉出於工件。

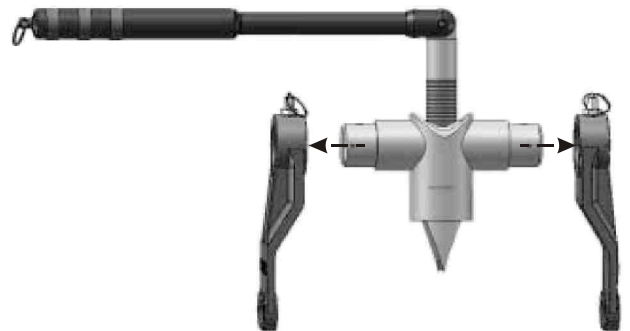


5. 維修和潤滑

5.3 將彈簧插銷拉開，好將左邊的腳座取下。

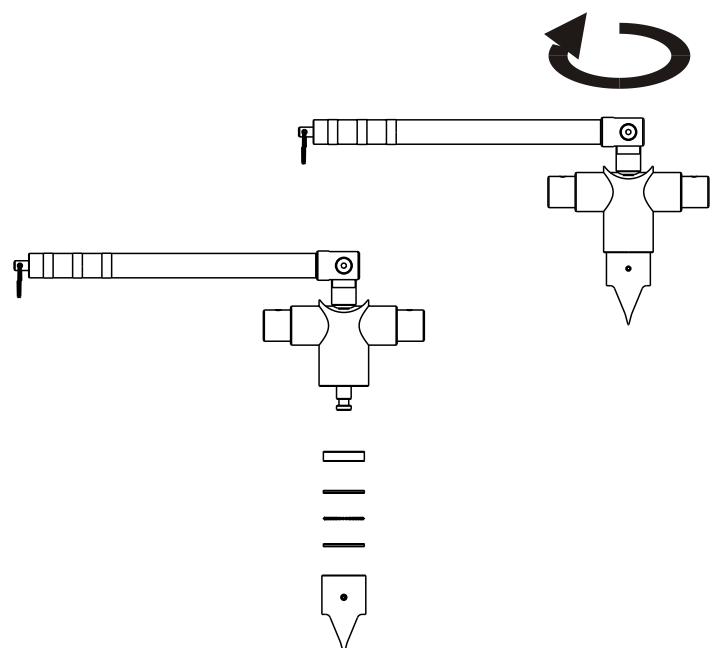


5.4 同上，將右邊的腳座取下。



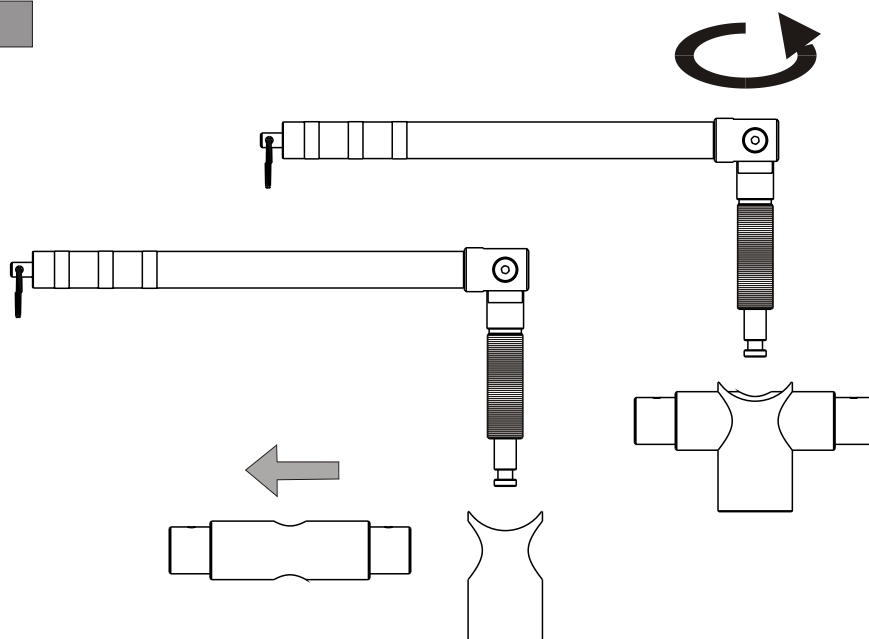
5.5 轉動搖柄，讓撐開楔可以拆下。

從工件上將撐開楔和軸承拆下。

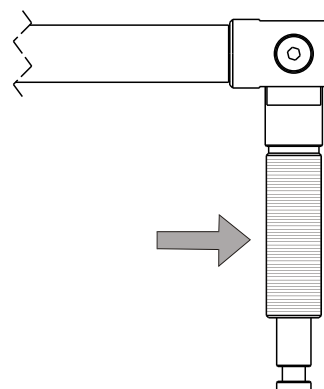


5. 維修和潤滑

- 5.6 將螺桿轉出，
並將本體和支桿取出。



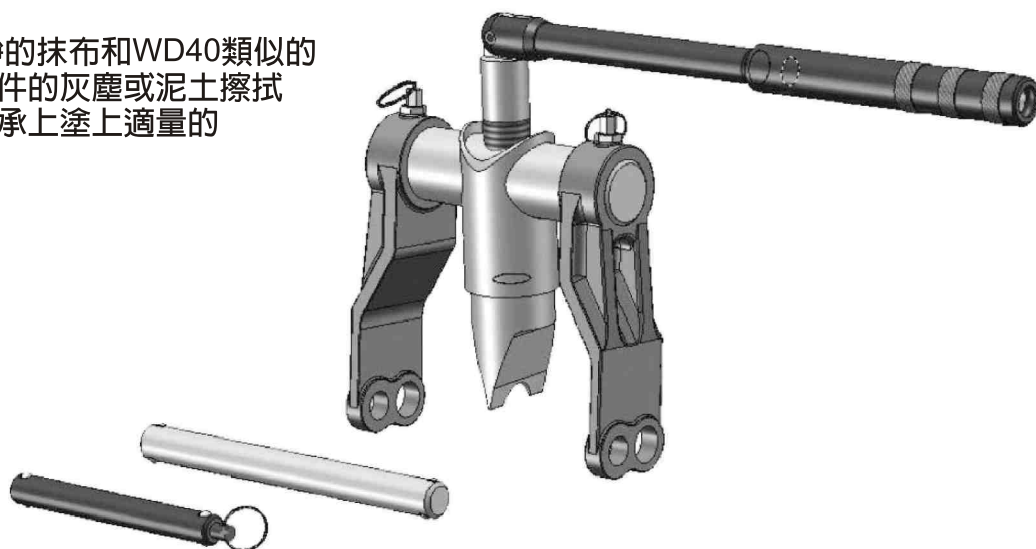
- 5.7 在螺桿上塗上適當的潤滑油。
將零件清理乾淨，並檢查是否有磨損。
將有損傷的零件重新換上SUN RUN 零件。



- 5.8 依步驟 5.7 至 5.2，重新再裝回新零件。



注意：用乾淨的抹布和WD40類似的清潔液，將工件的灰塵或泥土擦拭乾淨，再在軸承上塗上適量的潤滑劑。



參考附表，依不同種類的法蘭盤，選用適當的撐開桿

以下為法蘭種類，對照其頁數

ASME	B16.5 Weldneck, Threaded , Slip-on and Blind flanges	→	Page 11
	B16.5 Socket welded	→	Page 11
	B16.5 Long welding neck flange	→	Page 12
	B16.5 Lapped flange	→	Page 12
	B16.47 Weldneck and Blind flanges	→	Page 13
ANSI	Reducing	→	Page 13
	Orifice- Weldneck flange	→	Page 14
	Orifice- Slip-on and Threaded flanges	→	Page 14
Bs10		→	Page 15

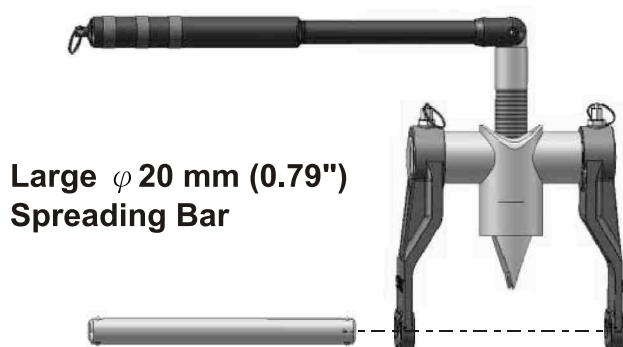


圖 1

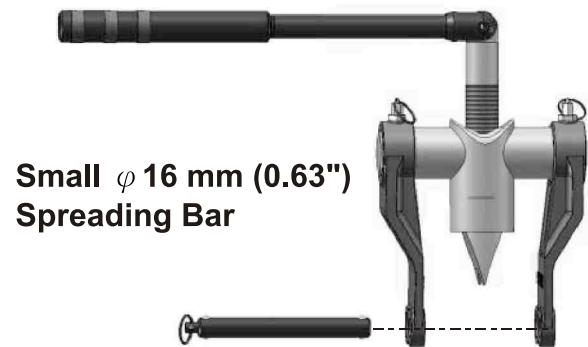


圖 2

ASME B16.5 Weldneck, Threaded , Slip-on and Blind flanges

NPS	Class						
	150	300	400	600	900	1500	2500
1/2"	Small Bar	Small Bar	Small Bar	Small Bar	Large Bar	Large Bar	Large Bar
3/4"	Small Bar	Small Bar	Small Bar	Small Bar	Large Bar	Large Bar	Large Bar
1"	Small Bar	Small Bar	Small Bar	Small Bar	Large Bar	Large Bar	Large Bar
1 1/4"	Small Bar	Small Bar	Small Bar	Small Bar	Large Bar	Large Bar	Large Bar
1 1/2"	Small Bar	Large Bar	Large Bar	Large Bar	Large Bar	Large Bar	Large Bar
2"	Small Bar	Large Bar	Large Bar	Large Bar	Large Bar	Large Bar	Large Bar
2 1/2"	Small Bar	Large Bar	Large Bar	Large Bar	Large Bar	Large Bar	Large Bar
3"	Small Bar	Large Bar	Large Bar	Large Bar	Large Bar	Large Bar	Large Bar
3 1/2"	Small Bar	Large Bar	Large Bar	Large Bar	Large Bar	Large Bar	
4"	Small Bar	Large Bar	Large Bar	Large Bar	Large Bar	Large Bar	
5"	Large Bar	Large Bar	Large Bar	Large Bar	Large Bar		
6"	Large Bar	Large Bar	Large Bar	Large Bar	Large Bar		
8"	Large Bar	Large Bar	Large Bar	Large Bar	Large Bar		
10"	Large Bar	Large Bar	Large Bar	Large Bar			
12"	Large Bar	Large Bar	Large Bar	Large Bar			
14"	Large Bar	Large Bar	Large Bar				
16"	Large Bar	Large Bar	Large Bar				
18"	Large Bar	Large Bar	Large Bar				
20"	Large Bar	Large Bar					
22"							
24"	Large Bar	Large Bar					
26"	Large Bar						
28"	Large Bar						
30"	Large Bar						

ASME B16.5 Socket welded flange

NPS	Class			
	150	300	600	1500
1/2"	Small Bar	Small Bar	Small Bar	Large Bar
3/4"	Small Bar	Small Bar	Small Bar	Large Bar
1"	Small Bar	Small Bar	Small Bar	Large Bar
1 1/4"	Small Bar	Small Bar	Small Bar	Large Bar
1 1/2"	Small Bar	Small Bar	Small Bar	Large Bar
2"	Small Bar	Small Bar	Small Bar	Large Bar
2 1/2"	Small Bar	Large Bar	Large Bar	Large Bar
3"	Small Bar	Large Bar	Large Bar	

ASME B16.5 Long welding neck flange

NPS	Class			
	150	300	600	900
1/2"	Small Bar	Small Bar	Small Bar	Large Bar
3/4"	Small Bar	Small Bar	Small Bar	Large Bar
1"	Small Bar	Small Bar	Small Bar	Large Bar
1 1/4"	Small Bar	Small Bar	Small Bar	Large Bar
1 1/2"	Small Bar	Small Bar	Small Bar	Large Bar
2"	Small Bar	Small Bar	Small Bar	Large Bar
2 1/2"	Small Bar	Large Bar	Large Bar	Large Bar
3"	Small Bar	Large Bar	Large Bar	Large Bar
3 1/2"	Small Bar	Large Bar	Large Bar	Large Bar
4"	Small Bar	Large Bar	Large Bar	Large Bar
5"	Large Bar	Large Bar	Large Bar	Large Bar
6"	Large Bar	Large Bar	Large Bar	Large Bar
8"	Large Bar	Large Bar	Large Bar	Large Bar
10"	Large Bar	Large Bar	Large Bar	
12"	Large Bar	Large Bar	Large Bar	
14"	Large Bar	Large Bar		
16"	Large Bar	Large Bar		
18"	Large Bar	Large Bar		
20"	Large Bar	Large Bar		
22"				
24"	Large Bar	Large Bar		
26"	Large Bar			
28"	Large Bar			
30"	Large Bar			

ASME B16.5 Lapped flange

NPS	Class						
	150	300	400	600	900	1500	2500
1/2"	Small Bar	Small Bar	Small Bar	Small Bar	Large Bar	Large Bar	Large Bar
3/4"	Small Bar	Small Bar	Small Bar	Small Bar	Large Bar	Large Bar	Large Bar
1"	Small Bar	Small Bar	Small Bar	Small Bar	Large Bar	Large Bar	Large Bar
1 1/4"	Small Bar	Small Bar	Small Bar	Small Bar	Large Bar	Large Bar	Large Bar
1 1/2"	Small Bar	Small Bar	Small Bar	Small Bar	Large Bar	Large Bar	Large Bar
2"	Small Bar	Small Bar	Small Bar	Small Bar	Large Bar	Large Bar	Large Bar
2 1/2"	Small Bar	Large Bar	Large Bar	Large Bar	Large Bar	Large Bar	
3"	Small Bar	Large Bar	Large Bar	Large Bar	Large Bar	Large Bar	
3 1/2"	Small Bar	Large Bar	Large Bar	Large Bar	Large Bar		
4"	Small Bar	Large Bar	Large Bar	Large Bar	Large Bar		
5"	Large Bar	Large Bar	Large Bar	Large Bar			
6"	Large Bar	Large Bar	Large Bar	Large Bar			
8"	Large Bar	Large Bar	Large Bar	Large Bar			
10"	Large Bar	Large Bar	Large Bar				
12"	Large Bar	Large Bar					

ASME B16.47 Weldneck and Blind flanges

	Class
NPS	150
26"	Large Bar
28"	Large Bar
30"	Large Bar
32"	Large Bar
34"	Large Bar
36"	Large Bar
42"	Large Bar
48"	Large Bar
54"	Large Bar
60"	Large Bar

ANSI Reducing

	Class						
NPS	150	300	400	600	900	1500	2500
1/2"	Small Bar	Small Bar	Small Bar	Small Bar	Large Bar	Large Bar	Large Bar
3/4"	Small Bar	Small Bar	Small Bar	Small Bar	Large Bar	Large Bar	Large Bar
1"	Small Bar	Small Bar	Small Bar	Small Bar	Large Bar	Large Bar	Large Bar
1 1/4"	Small Bar	Small Bar	Small Bar	Small Bar	Large Bar	Large Bar	Large Bar
1 1/2"	Small Bar	Small Bar	Small Bar	Small Bar	Large Bar	Large Bar	Large Bar
2"	Small Bar	Small Bar	Small Bar	Small Bar	Large Bar	Large Bar	Large Bar
2 1/2"	Small Bar	Large Bar	Large Bar	Large Bar	Large Bar	Large Bar	Large Bar
3"	Small Bar	Large Bar	Large Bar	Large Bar	Large Bar	Large Bar	Large Bar
3 1/2"	Small Bar	Large Bar	Large Bar	Large Bar	Large Bar	Large Bar	
4"	Small Bar	Large Bar	Large Bar	Large Bar	Large Bar	Large Bar	
5"	Large Bar	Large Bar	Large Bar	Large Bar	Large Bar		
6"	Large Bar	Large Bar	Large Bar	Large Bar	Large Bar		
8"	Large Bar	Large Bar	Large Bar	Large Bar	Large Bar		
10"	Large Bar	Large Bar	Large Bar	Large Bar			
12"	Large Bar	Large Bar	Large Bar	Large Bar			
14"	Large Bar	Large Bar	Large Bar				
16"	Large Bar	Large Bar	Large Bar				
18"	Large Bar	Large Bar	Large Bar				
20"	Large Bar	Large Bar					
22"	Large Bar	Large Bar					
24"	Large Bar	Large Bar					
26"	Large Bar						
28"	Large Bar						
30"	Large Bar						

ANSI Orifice- Weldneck flange

NPS	Class					
	300	400	600	900	1500	2500
1"	Small Bar	Small Bar	Small Bar	Large Bar	Large Bar	Large Bar
1 1/2"	Large Bar	Large Bar	Large Bar	Large Bar	Large Bar	Large Bar
2"	Small Bar	Small Bar	Small Bar	Large Bar	Large Bar	Large Bar
2 1/2"	Large Bar	Large Bar	Large Bar	Large Bar	Large Bar	Large Bar
3"	Large Bar	Large Bar	Large Bar	Large Bar	Large Bar	Large Bar
4"	Large Bar	Large Bar	Large Bar	Large Bar	Large Bar	
6"	Large Bar	Large Bar	Large Bar	Large Bar		
8"	Large Bar	Large Bar	Large Bar	Large Bar		
10"	Large Bar	Large Bar	Large Bar			
12"	Large Bar	Large Bar	Large Bar			
14"	Large Bar	Large Bar				
16"	Large Bar	Large Bar				
18"	Large Bar	Large Bar				
20"	Large Bar					
22"	Large Bar					
24"	Large Bar					

ANSI Orifice- Slip-on and Threaded flanges

NPS	Class
	300
1"	Small Bar
1 1/2"	Large Bar
2"	Small Bar
2 1/2"	Large Bar
3"	Large Bar
4"	Large Bar
6"	Large Bar
8"	Large Bar
10"	Large Bar
12"	Large Bar
14"	Large Bar
16"	Large Bar
18"	Large Bar
20"	Large Bar
22"	Large Bar
24"	Large Bar

Table

[illegible]

BS 10

Table										
NPS	A	D	E	F	H	J	K	R	S	T
33"	Large Bar	Large Bar	Large Bar	Large Bar						
35"	Large Bar	Large Bar	Large Bar	Large Bar						
36"	Large Bar	Large Bar	Large Bar	Large Bar						
39"	Large Bar	Large Bar	Large Bar	Large Bar						
42"	Large Bar	Large Bar	Large Bar	Large Bar						
45"	Large Bar	Large Bar	Large Bar	Large Bar						
48"	Large Bar	Large Bar	Large Bar	Large Bar						
54"	Large Bar	Large Bar								
60"	Large Bar	Large Bar								
66"	Large Bar	Large Bar								
72"	Large Bar	Large Bar								

出廠證明暨保固書

產品名稱：

型 號：

序 號：

出廠日期： / /

保固期間： / / ~ / /

該產品經公司嚴格品質管制,並測試合格出廠,本產品自驗收合格日起保固一年,如非人為使用不當或天然不可抗拒之災害,本公司免費維修,如非以上之原因本公司將酌收材料成本負責維修。

公司：巨輪興有限公司

負責人：蘇明益

高雄市岡山區岡山北路199號

TEL:886-7-6210505

FAX:886-7-6217575



巨輪興有限公司

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OPERATING INSTRUCTIONS

MINI-GAP

FLANGE SPREADER

SMG-7TM



English : E1~E16

中文
English
Ver.16

1. SAFETY PRECAUTIONS



Failure to comply with the following cautions and warnings could cause equipment damage and personal injury.



IMPORTANT : Minimum age of the operator must be 18 years. The operator must have read and understood all instructions, safety issues, cautions and warnings before starting to operate the SUN RUN equipment. The operator is responsible for this activity towards other persons.



WARNIGN : To avoid personal injury and possible equipment damage, make sure all hydraulic components withstand the maximum pressure of 700 bar(10,000psi).



WARNING: Always wear safety glasses. The operator must take precaution against injury due to failure the tool or workpiece.



DANGER: To avoid personal injury keep hands and feet away from cylinder and workpiece during operation.



IMPORTANT : Minimize the risk of overloading. Use hydraulic gauges in each hydraulic system to indicate safe operating loads. It is your window to what is happening in the system.



WARNING : Do not overload equipment. Overloading cause equipment failure and possible personal injury.



CAUTION : Make sure that all system components are protected from external sources of damage, such as excessive heat, flame, moving machine parts, sharp edges and corrosive chemicals.



CAUTION: Don't operate the equipment without lubricating the wedge and the 4 slide pins. Use high quality grease.



CAUTION: Avoid sharp bends and kinks that will cause severe back-up pressure in hoses. Bends and kinks lead to premature hose failure.



WARNING: Immediately replace worn or damaged parts with genuine SUN RUN parts. SUN RUN parts are designed to fit properly and withstand rated loads.



DANGER: Do not handle pressurized hoses. Escaping oil under pressure can penetrate the skin causing serious injury. If oil is injected under the skin, see a doctor immediately.



WARNING: Never pressurize uncoupled couplers. Only use hydraulic equipment in a coupled system.



IMPORTANT: Do not lift hydraulic equipment by the hoses or couplers. Use the carrying handle or other means of safe transport.



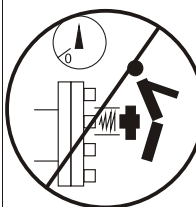
WARNING: Never place fingers in a joint held by activated wedge unless a safety block is located into the joint.



CAUTION: The handle of the wedge is there to stop operators holding spread plates as the wedge is retracted. This will stop fingers becoming jammed between plates.



CAUTION: Never hammer or force wedge to access gap.



Never stand in-line with the bolt axis while tensioning or de-tensioning is in progress. If the bolt should fail, serious personal injury or death could result if loose or broken parts become projectiles. All personnel must be aware of this potential hazard at all times.

2. SPECIFICATION

The SUN RUN SMG-7TM MINI-GAP FLANGE SPREADER is designed to aid the safe separation of flange faces. This system has a unique ability to break flange joints with a 2 mm gap between the flange faces. The tool is designed to separate flanges while applying an immense amount of force to the correct point of separation.

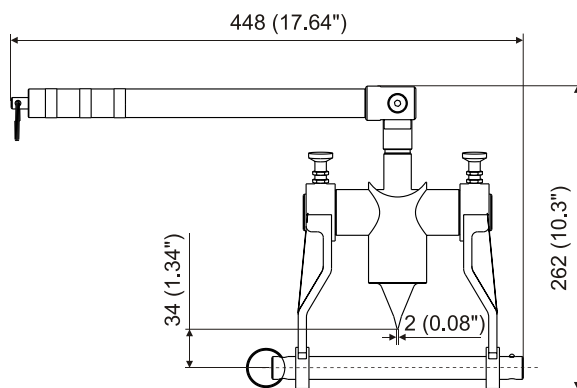
To extend the service life of the tool and to ensure the tool is used safely, operators must read this instruction manual carefully before using the equipment. Following these instructions will ensure maintenance and/or installation procedures are carried out in a reliable and safe manner.

- Offers a safe and reliable working method.
- Provides 6.8 tonnes of spreading force.
- Separates flange faces with a gap of 2 mm or greater.
- Is lightweight and easy to use.

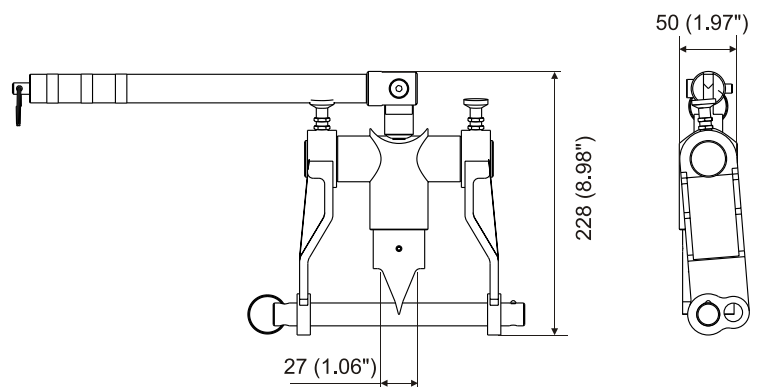
2.1 WEIGHTS AND DIMENSIONS

GROSS KIT WEIGHT: 5.5KG

Large $\varnothing$ 20 mm (0.79") spreading bar in mm (inch)

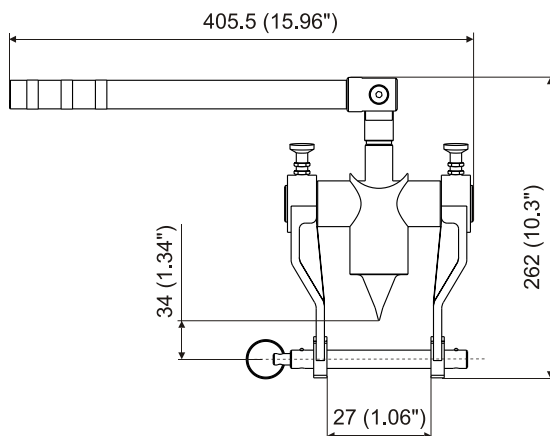


CLOSED

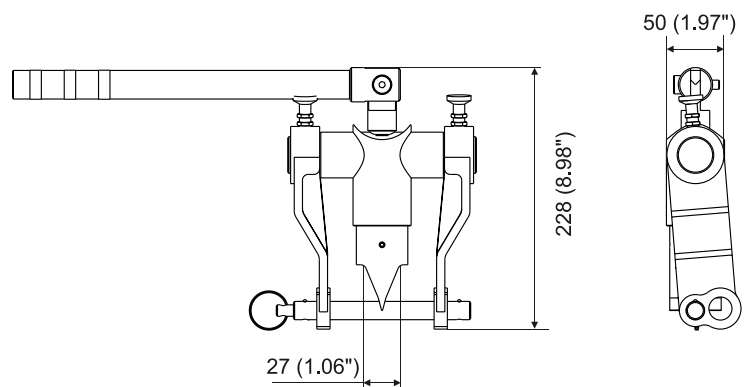


OPEN

Small $\varnothing$ 16 mm (0.63") spreading bar in mm (inch)



CLOSED



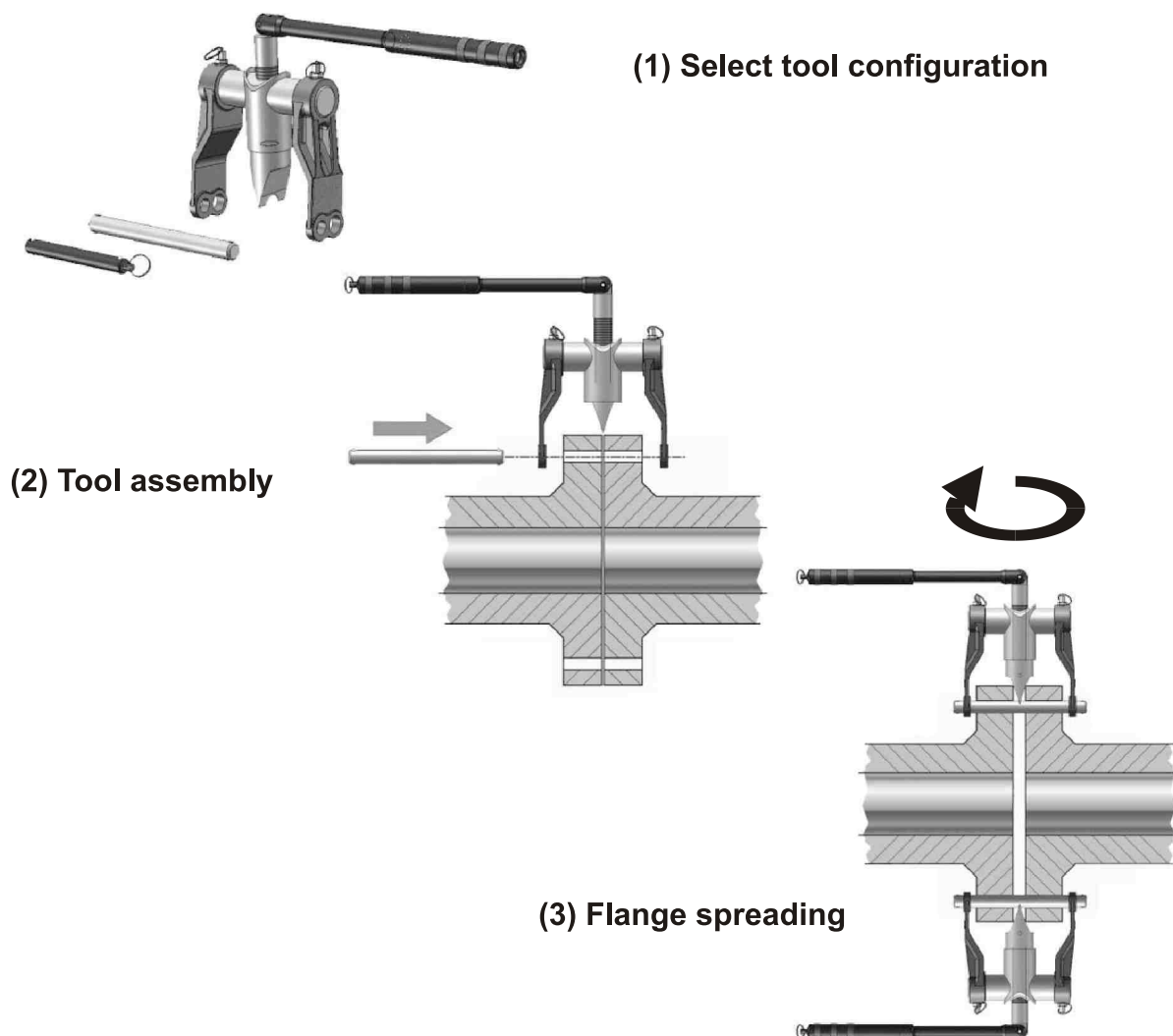
OPEN

2. SPECIFICATION

Model Number	Capacity (kN/ ton)	Spreading distance (mm)	Wt. (kg)	Range of application											
				BS10 Flanges		ASME B16.47 Flanges		ASME B16.5 Flanges		ASME B16.5 Flanges		ANSI reducing application Flanges		ANSI orifice application Flanges	
				Class	Range	Class	Range	Class	Range	Class	Range	Class	Range	Class	Range
SMG-7TM	68/ 7	2.0-27.0	11.5	H	0.5~24"	150	26~60"	150	2~48"	150	2~3"	150	2~48"	300	1~20"
				J	0.5~24"	300	26~60"	300	3/4~48"	300	3/4~3"	300	3/4~48"		
				K	0.5~20"										
				R	0.5~20"										
				S	0.5~16"										
				T	0.5~13"										

The tool achieves a spreading distance of 27 mm from 2 mm gap.

At a 7mm gap the tool steps down the spreading force applied from 6.8 tons to 3.9 tons.

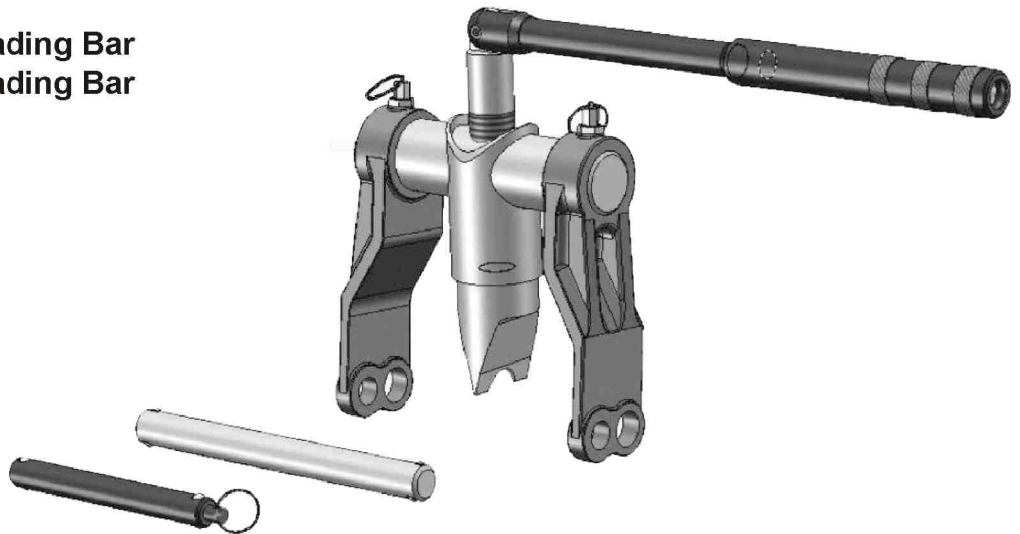


The operator MUST read this manual prior to using the tools.

3. LIST OF EQUIPMENT

SMG-7TM set includes:

- 1* SMG-7TM Tool
- 1* $\varnothing$ 16 mm (0.63") Spreading Bar
- 1* $\varnothing$ 20 mm (0.79") Spreading Bar
- 1* Instruction Manual



4. INSTALLATION AND OPERATION



Before attaching the tool, ensure at least two flange bolts remain in place, 180 degrees apart, with nuts loosened sufficiently enough for flange work to be carried out.

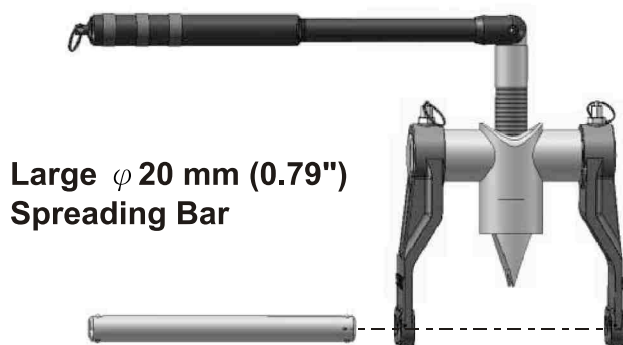
These bolts will reduce lateral flange movement during flange spreading and will help support the unit.



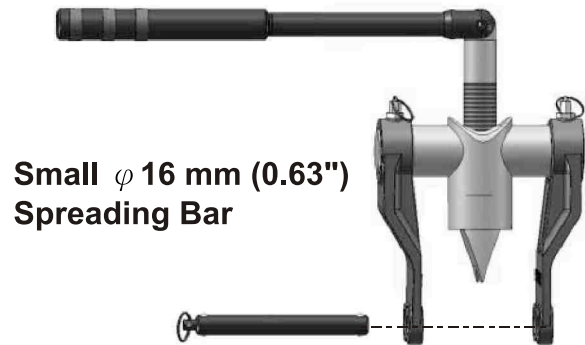
Do not extend the handle or use the smaller spreading bar as an extension bar.

Be aware of the dangers of breaking sealed flange joints. Ensure that relevant risk assessments have been carried out for the task and your company procedures must be followed at all times.

4. INSTALLATION AND OPERATION



Tool Configuration 1



Tool Configuration 2

4.2 Choose the suitable configuration for the size and class of flange joint you wish to separate.

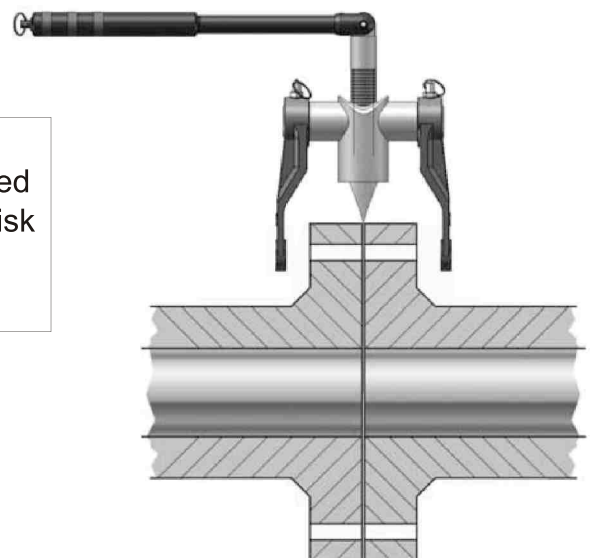
See the application charts found of this manual.

The spreading bars are designed to only fit the correct flange specification.
No two spreading bars can fit the same stud hole.



The flange bolting should be disassembled as per your company's procedures and risk assessment.

4.3 Place the tool over the flange joint and align with the desired stud hole.

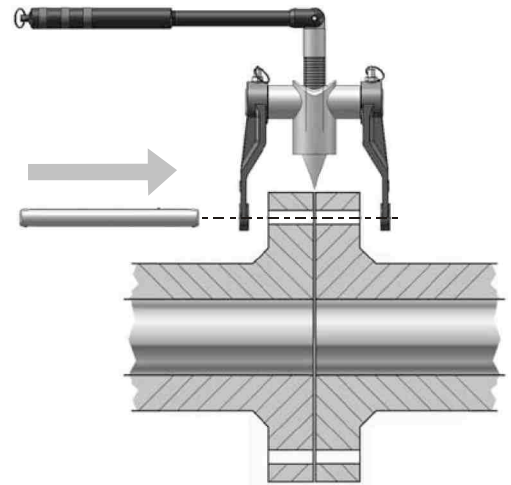


4. INSTALLATION AND OPERATION

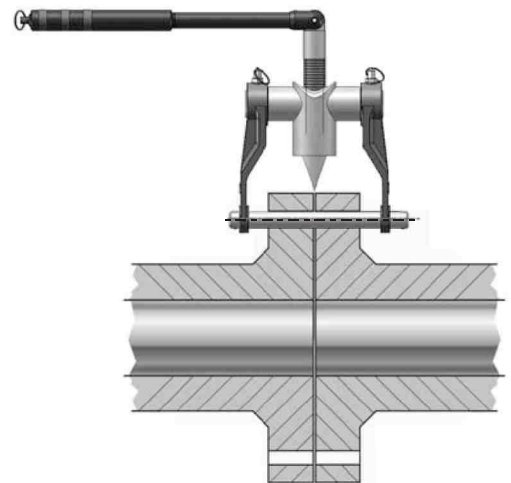
- 4.4 Engage the spreading bar through the leg of the tool and the flange stud hole.



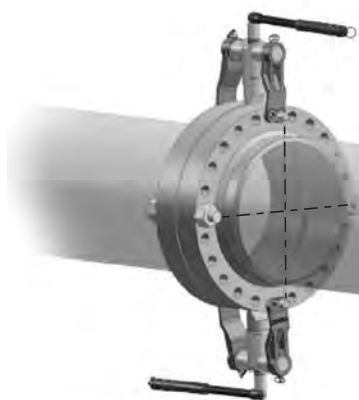
Do not hammer or use excessive force to fit the spreading bar. The bar should be fitted by hand.



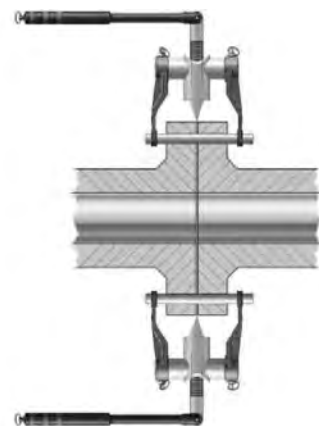
- 4.5 Take care to ensure the spreading bar is correctly fitted through the second leg of the tool. Check the wedge is positioned in the gap between the flange faces.



- 4.6 It is strongly recommended that two SMG-7TM Tools are used on the flange joint positioned 180 degrees apart.



Flange separation



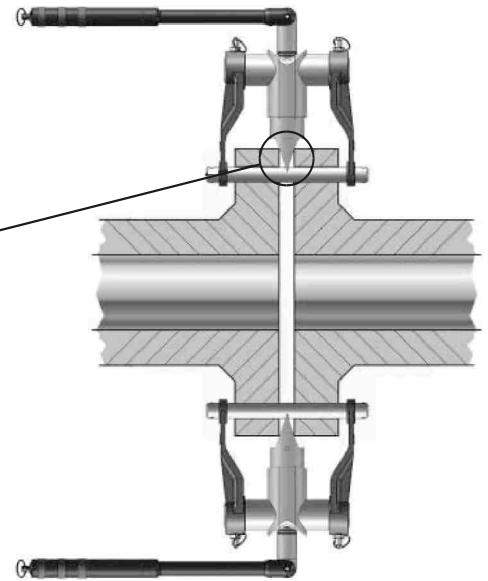
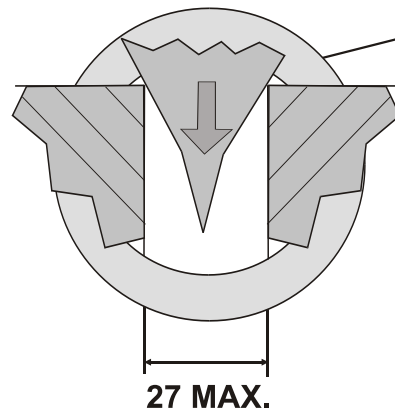
Flange spreading and seal removal



4. INSTALLATION AND OPERATION

- 4.7 Turn each opposing tool a half turn at a time until the desired gap is achieved. Care must be taken to ensure the force is applied evenly.

The maximum spreading distance for the SMG-7TM is 27 mm.

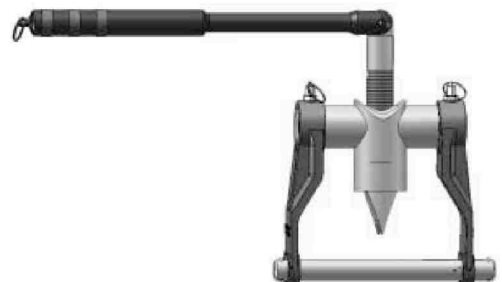


5. MAINTENANCE AND LUBRICATION

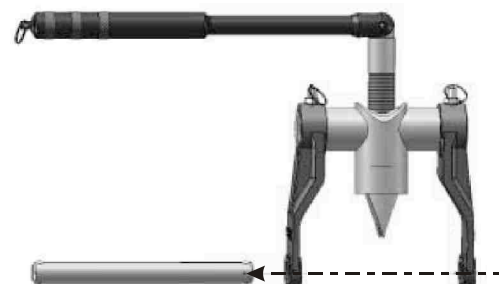
Before and after each job, the SUN RUN Mini-Gap mechanical tool kit must be checked to establish that they are complete and all items must be examined to ensure that they are serviceable.

A regular intervals, and specifically after being exposed to salt water, Mini-Gap mechanical tools should be dismantled and lubricated as follows:

- 5.1 Lay the tool on a bench or flat surface with the right hand side face down.

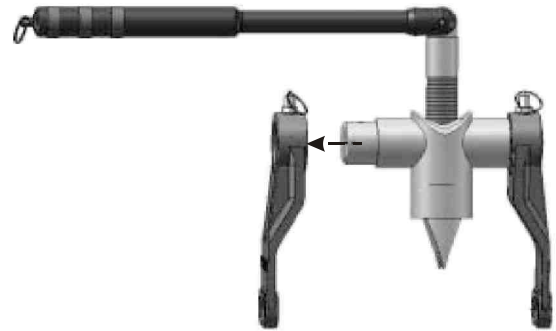
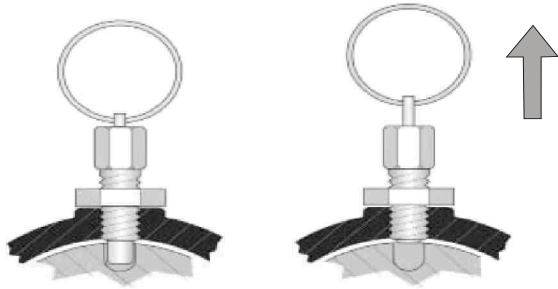


- 5.2 Pull the spreading bar out of the tool.

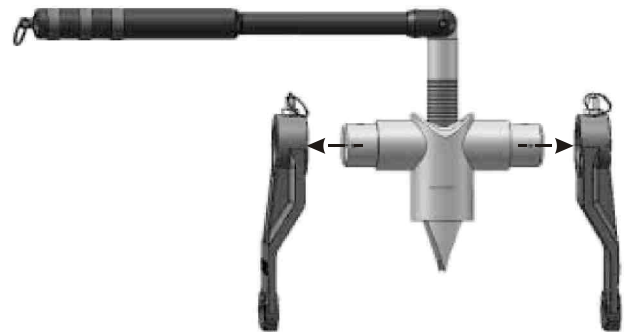


5. MAINTENANCE AND LUBRICATION

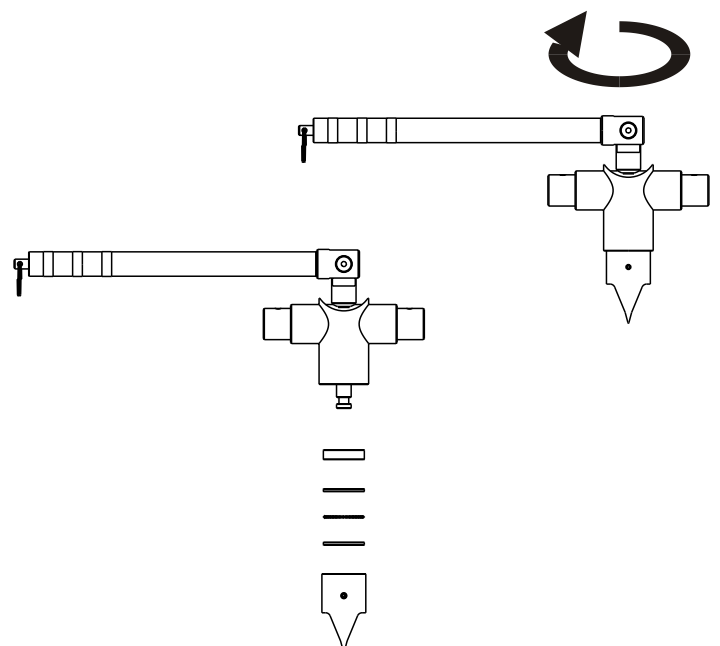
- 5.3 To Remove the left hand cast leg from the tool .
Pull the spring loaded plunger to release the leg.



- 5.4 Remove the right hand cast leg from the tool .

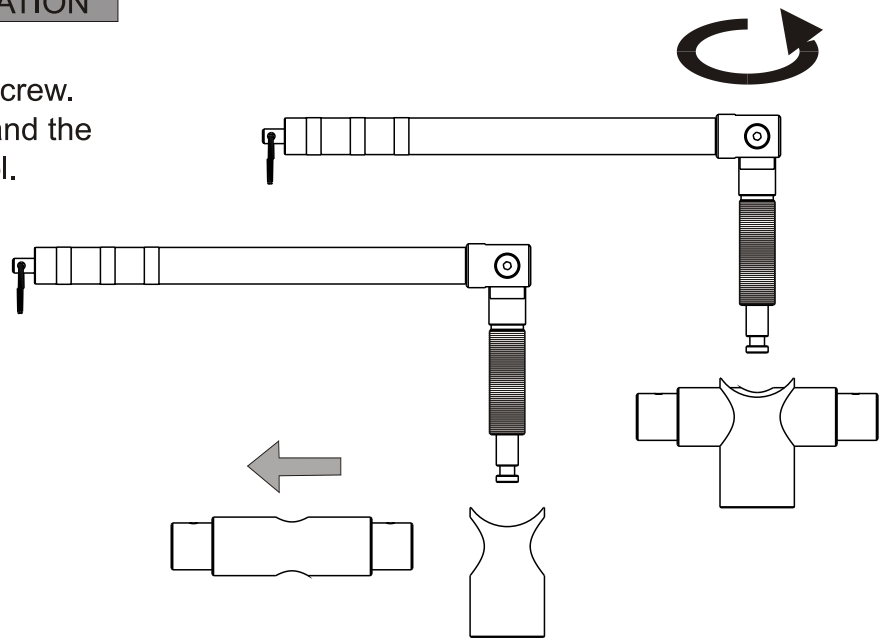


- 5.5 Drive the handle so that the splitter wedge moves down. Then remove the Splitter wedge and Thrust bearing from the tool.

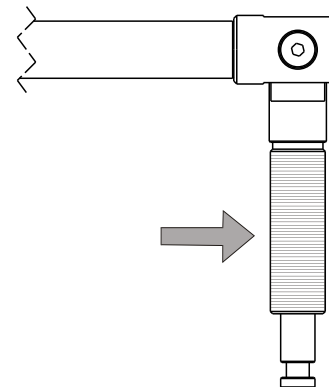


5. MAINTENANCE AND LUBRICATION

- 5.6 Fully unscrew the drive screw.
Remove the main body and the
outer sleeve from the tool.

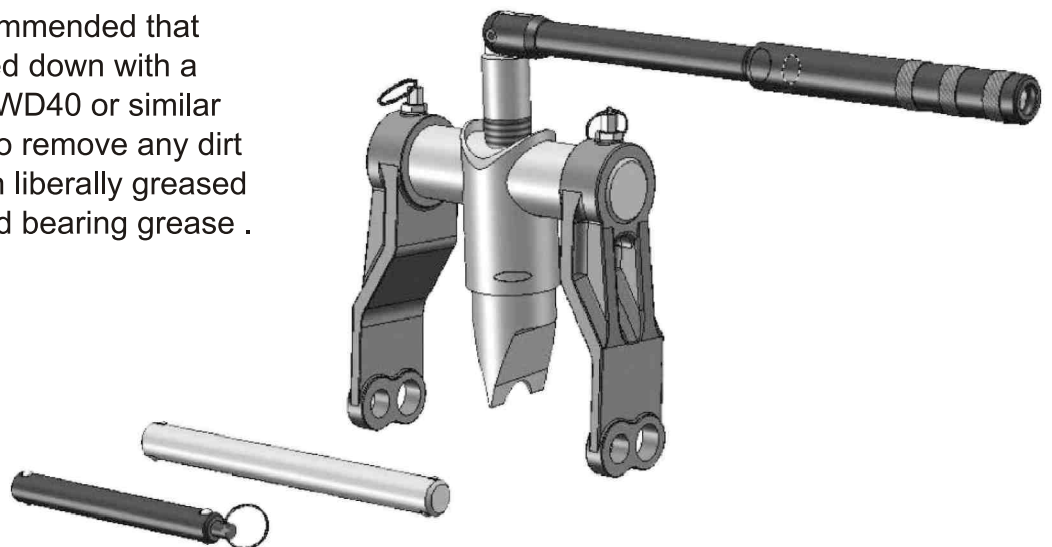


- 5.7 Apply grease to the drive screw.
Clean all components and inspect
for wear and damage. Replace all
worn and damaged components
with genuine SUN RUN spares.



- 5.8 Reassemble by reversing the disassembly procedure (steps 5.2 to 5.7)

I Note: it is recommended that
the tool is wiped down with a
clean rag and WD40 or similar
cleaning fluid to remove any dirt
or grit and then liberally greased
with a high load bearing grease .

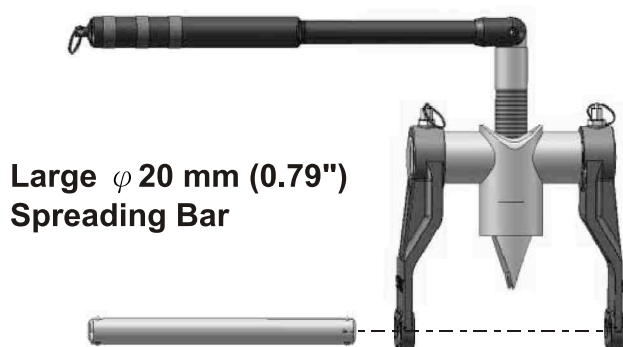


7. RANGE OF APPLICATION CHARTS

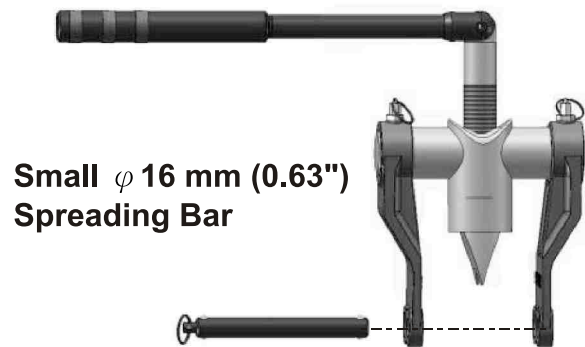
Use the charts on the following pages to determine which spreading bar is suitable for a particular flange .

The charts are categorised as per flange type.

ASME	B16.5 Weldneck, Threaded , Slip-on and Blind flanges	→	Page 11
	B16.5 Socket welded	→	Page 11
	B16.5 Long welding neck flange	→	Page 12
	B16.5 Lapped flange	→	Page 12
	B16.47 Weldneck and Blind flanges	→	Page 13
ANSI	Reducing	→	Page 13
	Orifice- Weldneck flange	→	Page 14
	Orifice- Slip-on and Threaded flanges	→	Page 14
Bs10		→	Page 15



Tool Configuration 1



Tool Configuration 2

ASME B16.5 Weldneck, Threaded , Slip-on and Blind flanges

NPS	Class						
	150	300	400	600	900	1500	2500
1/2"	Small Bar	Small Bar	Small Bar	Small Bar	Large Bar	Large Bar	Large Bar
3/4"	Small Bar	Small Bar	Small Bar	Small Bar	Large Bar	Large Bar	Large Bar
1"	Small Bar	Small Bar	Small Bar	Small Bar	Large Bar	Large Bar	Large Bar
1 1/4"	Small Bar	Small Bar	Small Bar	Small Bar	Large Bar	Large Bar	Large Bar
1 1/2"	Small Bar	Large Bar	Large Bar	Large Bar	Large Bar	Large Bar	Large Bar
2"	Small Bar	Large Bar	Large Bar	Large Bar	Large Bar	Large Bar	Large Bar
2 1/2"	Small Bar	Large Bar	Large Bar	Large Bar	Large Bar	Large Bar	Large Bar
3"	Small Bar	Large Bar	Large Bar	Large Bar	Large Bar	Large Bar	Large Bar
3 1/2"	Small Bar	Large Bar	Large Bar	Large Bar	Large Bar	Large Bar	
4"	Small Bar	Large Bar	Large Bar	Large Bar	Large Bar	Large Bar	
5"	Large Bar	Large Bar	Large Bar	Large Bar	Large Bar		
6"	Large Bar	Large Bar	Large Bar	Large Bar	Large Bar		
8"	Large Bar	Large Bar	Large Bar	Large Bar	Large Bar		
10"	Large Bar	Large Bar	Large Bar	Large Bar			
12"	Large Bar	Large Bar	Large Bar	Large Bar			
14"	Large Bar	Large Bar	Large Bar				
16"	Large Bar	Large Bar	Large Bar				
18"	Large Bar	Large Bar	Large Bar				
20"	Large Bar	Large Bar					
22"							
24"	Large Bar	Large Bar					
26"	Large Bar						
28"	Large Bar						
30"	Large Bar						

ASME B16.5 Socket welded flange

NPS	Class			
	150	300	600	1500
1/2"	Small Bar	Small Bar	Small Bar	Large Bar
3/4"	Small Bar	Small Bar	Small Bar	Large Bar
1"	Small Bar	Small Bar	Small Bar	Large Bar
1 1/4"	Small Bar	Small Bar	Small Bar	Large Bar
1 1/2"	Small Bar	Small Bar	Small Bar	Large Bar
2"	Small Bar	Small Bar	Small Bar	Large Bar
2 1/2"	Small Bar	Large Bar	Large Bar	Large Bar
3"	Small Bar	Large Bar	Large Bar	

ASME B16.5 Long welding neck flange

NPS	Class			
	150	300	600	900
1/2"	Small Bar	Small Bar	Small Bar	Large Bar
3/4"	Small Bar	Small Bar	Small Bar	Large Bar
1"	Small Bar	Small Bar	Small Bar	Large Bar
1 1/4"	Small Bar	Small Bar	Small Bar	Large Bar
1 1/2"	Small Bar	Small Bar	Small Bar	Large Bar
2"	Small Bar	Small Bar	Small Bar	Large Bar
2 1/2"	Small Bar	Large Bar	Large Bar	Large Bar
3"	Small Bar	Large Bar	Large Bar	Large Bar
3 1/2"	Small Bar	Large Bar	Large Bar	Large Bar
4"	Small Bar	Large Bar	Large Bar	Large Bar
5"	Large Bar	Large Bar	Large Bar	Large Bar
6"	Large Bar	Large Bar	Large Bar	Large Bar
8"	Large Bar	Large Bar	Large Bar	Large Bar
10"	Large Bar	Large Bar	Large Bar	
12"	Large Bar	Large Bar	Large Bar	
14"	Large Bar	Large Bar		
16"	Large Bar	Large Bar		
18"	Large Bar	Large Bar		
20"	Large Bar	Large Bar		
22"				
24"	Large Bar	Large Bar		
26"	Large Bar			
28"	Large Bar			
30"	Large Bar			

ASME B16.5 Lapped flange

NPS	Class						
	150	300	400	600	900	1500	2500
1/2"	Small Bar	Small Bar	Small Bar	Small Bar	Large Bar	Large Bar	Large Bar
3/4"	Small Bar	Small Bar	Small Bar	Small Bar	Large Bar	Large Bar	Large Bar
1"	Small Bar	Small Bar	Small Bar	Small Bar	Large Bar	Large Bar	Large Bar
1 1/4"	Small Bar	Small Bar	Small Bar	Small Bar	Large Bar	Large Bar	Large Bar
1 1/2"	Small Bar	Small Bar	Small Bar	Small Bar	Large Bar	Large Bar	Large Bar
2"	Small Bar	Small Bar	Small Bar	Small Bar	Large Bar	Large Bar	Large Bar
2 1/2"	Small Bar	Large Bar	Large Bar	Large Bar	Large Bar	Large Bar	
3"	Small Bar	Large Bar	Large Bar	Large Bar	Large Bar	Large Bar	
3 1/2"	Small Bar	Large Bar	Large Bar	Large Bar	Large Bar		
4"	Small Bar	Large Bar	Large Bar	Large Bar	Large Bar		
5"	Large Bar	Large Bar	Large Bar	Large Bar			
6"	Large Bar	Large Bar	Large Bar	Large Bar			
8"	Large Bar	Large Bar	Large Bar	Large Bar			
10"	Large Bar	Large Bar	Large Bar				
12"	Large Bar	Large Bar					

ASME B16.47 Weldneck and Blind flanges

	Class
NPS	150
26"	Large Bar
28"	Large Bar
30"	Large Bar
32"	Large Bar
34"	Large Bar
36"	Large Bar
42"	Large Bar
48"	Large Bar
54"	Large Bar
60"	Large Bar

ANSI Reducing

	Class						
NPS	150	300	400	600	900	1500	2500
1/2"	Small Bar	Small Bar	Small Bar	Small Bar	Large Bar	Large Bar	Large Bar
3/4"	Small Bar	Small Bar	Small Bar	Small Bar	Large Bar	Large Bar	Large Bar
1"	Small Bar	Small Bar	Small Bar	Small Bar	Large Bar	Large Bar	Large Bar
1 1/4"	Small Bar	Small Bar	Small Bar	Small Bar	Large Bar	Large Bar	Large Bar
1 1/2"	Small Bar	Small Bar	Small Bar	Small Bar	Large Bar	Large Bar	Large Bar
2"	Small Bar	Small Bar	Small Bar	Small Bar	Large Bar	Large Bar	Large Bar
2 1/2"	Small Bar	Large Bar	Large Bar	Large Bar	Large Bar	Large Bar	Large Bar
3"	Small Bar	Large Bar	Large Bar	Large Bar	Large Bar	Large Bar	Large Bar
3 1/2"	Small Bar	Large Bar	Large Bar	Large Bar	Large Bar	Large Bar	
4"	Small Bar	Large Bar	Large Bar	Large Bar	Large Bar	Large Bar	
5"	Large Bar	Large Bar	Large Bar	Large Bar	Large Bar		
6"	Large Bar	Large Bar	Large Bar	Large Bar	Large Bar		
8"	Large Bar	Large Bar	Large Bar	Large Bar	Large Bar		
10"	Large Bar	Large Bar	Large Bar	Large Bar			
12"	Large Bar	Large Bar	Large Bar	Large Bar			
14"	Large Bar	Large Bar	Large Bar				
16"	Large Bar	Large Bar	Large Bar				
18"	Large Bar	Large Bar	Large Bar				
20"	Large Bar	Large Bar					
22"	Large Bar	Large Bar					
24"	Large Bar	Large Bar					
26"	Large Bar						
28"	Large Bar						
30"	Large Bar						

ANSI Orifice- Weldneck flange

NPS	Class					
	300	400	600	900	1500	2500
1"	Small Bar	Small Bar	Small Bar	Large Bar	Large Bar	Large Bar
1 1/2"	Large Bar	Large Bar	Large Bar	Large Bar	Large Bar	Large Bar
2"	Small Bar	Small Bar	Small Bar	Large Bar	Large Bar	Large Bar
2 1/2"	Large Bar	Large Bar	Large Bar	Large Bar	Large Bar	Large Bar
3"	Large Bar	Large Bar	Large Bar	Large Bar	Large Bar	Large Bar
4"	Large Bar	Large Bar	Large Bar	Large Bar	Large Bar	
6"	Large Bar	Large Bar	Large Bar	Large Bar		
8"	Large Bar	Large Bar	Large Bar	Large Bar		
10"	Large Bar	Large Bar	Large Bar			
12"	Large Bar	Large Bar	Large Bar			
14"	Large Bar	Large Bar				
16"	Large Bar	Large Bar				
18"	Large Bar	Large Bar				
20"	Large Bar					
22"	Large Bar					
24"	Large Bar					

ANSI Orifice- Slip-on and Threaded flanges

NPS	Class
	300
1"	Small Bar
1 1/2"	Large Bar
2"	Small Bar
2 1/2"	Large Bar
3"	Large Bar
4"	Large Bar
6"	Large Bar
8"	Large Bar
10"	Large Bar
12"	Large Bar
14"	Large Bar
16"	Large Bar
18"	Large Bar
20"	Large Bar
22"	Large Bar
24"	Large Bar

[illegible]

BS 10

BS 10	Table										
	NPS	A	D	E	F	H	J	K	R	S	T
	33"	Large Bar	Large Bar	Large Bar	Large Bar	Large Bar					
	35"	Large Bar	Large Bar	Large Bar	Large Bar						
	36"	Large Bar	Large Bar	Large Bar	Large Bar						
	39"	Large Bar	Large Bar	Large Bar	Large Bar						
	42"	Large Bar	Large Bar	Large Bar	Large Bar						
	45"	Large Bar	Large Bar	Large Bar	Large Bar						
	48"	Large Bar	Large Bar	Large Bar	Large Bar						
	54"	Large Bar	Large Bar	Large Bar	Large Bar						
	60"	Large Bar	Large Bar	Large Bar							
66"	Large Bar	Large Bar	Large Bar								
72"	Large Bar	Large Bar	Large Bar								