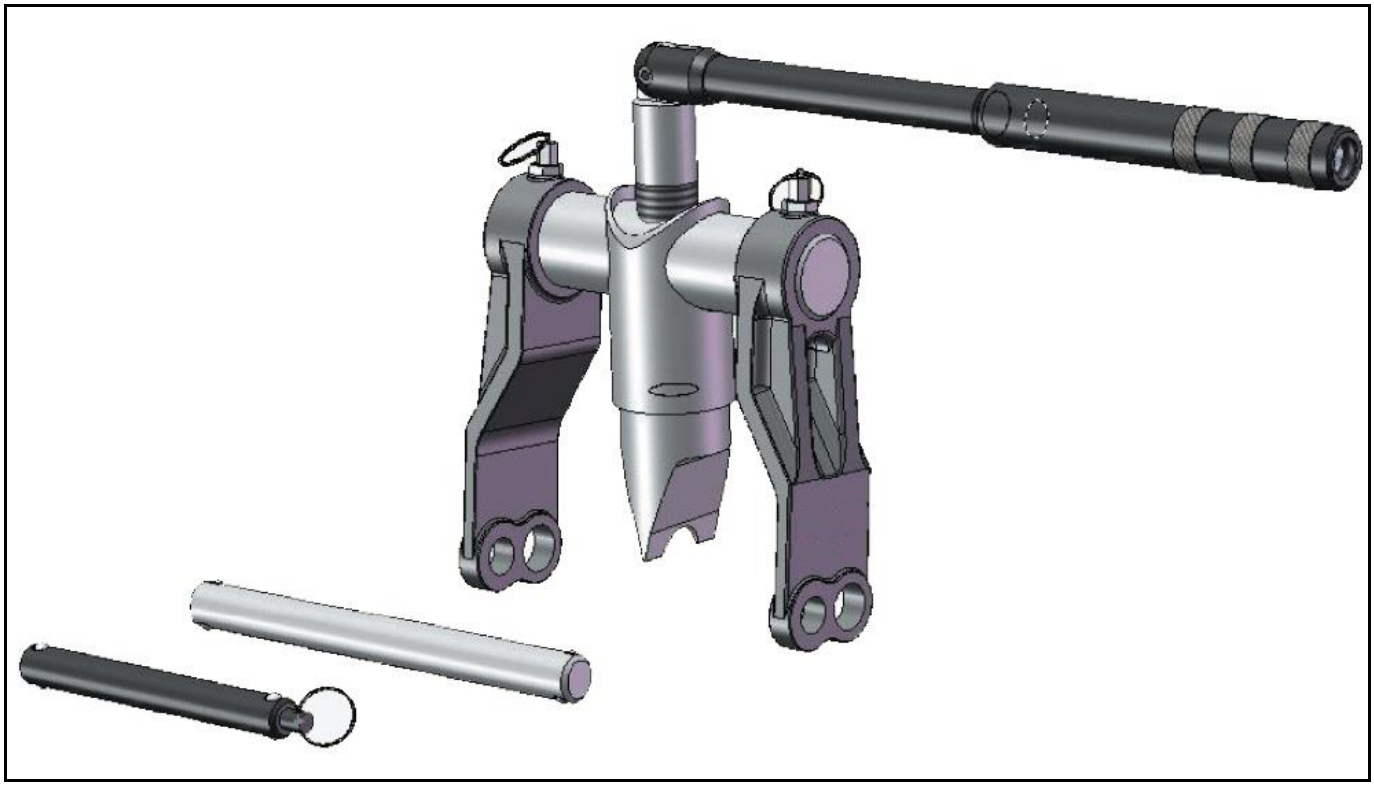
CHRISTIE
TOTAL TORQUE SOLUTIONS

THE WEDGE

WC7TM MINI-GAP FLANGE SPREADER

OPERATOR INSTRUCTION MANUAL



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1 – INTRODUCTION

The Christie WC7TM 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 2mm 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.

The Christie WC7TM Mini-Gap Flange Spreader:

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

2 – SAFETY INFORMATION

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

Failure to comply with the following cautions and warnings could cause equipment damage and personal injury; read the manual fully!

Read all the following instructions, warnings and cautions carefully. Follow all safety precautions to avoid personal injury or property damage during system operation.

W. Christie (Industrial) Limited cannot be responsible for damage or injury resulting from unsafe product use, lack of maintenance or incorrect product and/or system operation. Contact W. Christie (Industrial) Limited when in doubt as to the safety precautions and applications.

In all installations the site safety requirements must be adhered to. ALSO the safety of the operator, and when present, any assisting personnel, is of paramount importance along with the safety of others including, when present, the general public.

These instructions are only to cover the safe operation of the Christie WC7TM Mini-gap Mechanical Tools during normal maintenance/installation operations. All other safety aspects must be controlled by the operation supervisor.

A **CAUTION** is used to indicate correct operating or maintenance procedures and practices to prevent damage to, or destruction of equipment or other property.

A **WARNING** indicates a potential danger that requires correct procedures or practices to avoid personal injury.

A **DANGER** is only used when your action or lack of action may cause serious injury or even death.

IMPORTANT: Operator must be competent in the use of hydraulic equipment. The operator must have read and understood all instructions, safety issues, cautions and warnings before starting to operate the Christie equipment.

WARNING: Do not overload equipment. Overloading causes 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.

WARNING: Immediately replace worn or damaged parts with genuine Christie parts. Christie parts are designed to fit properly and withstand rated loads. For repair or maintenance service contact W. Christie (Industrial) Limited

DANGER: To avoid personal injury keep hands and feet way from the tool and workpiece during operation.

WARNING: Always wear suitable clothing and Personal Protective Equipment (PPE).

WARNING: Never Place fingers in a joint held by an activated tool

CAUTION: Never hammer nor force the tool into a bolt hold; if it does not fit easily you are using the wrong size of tool

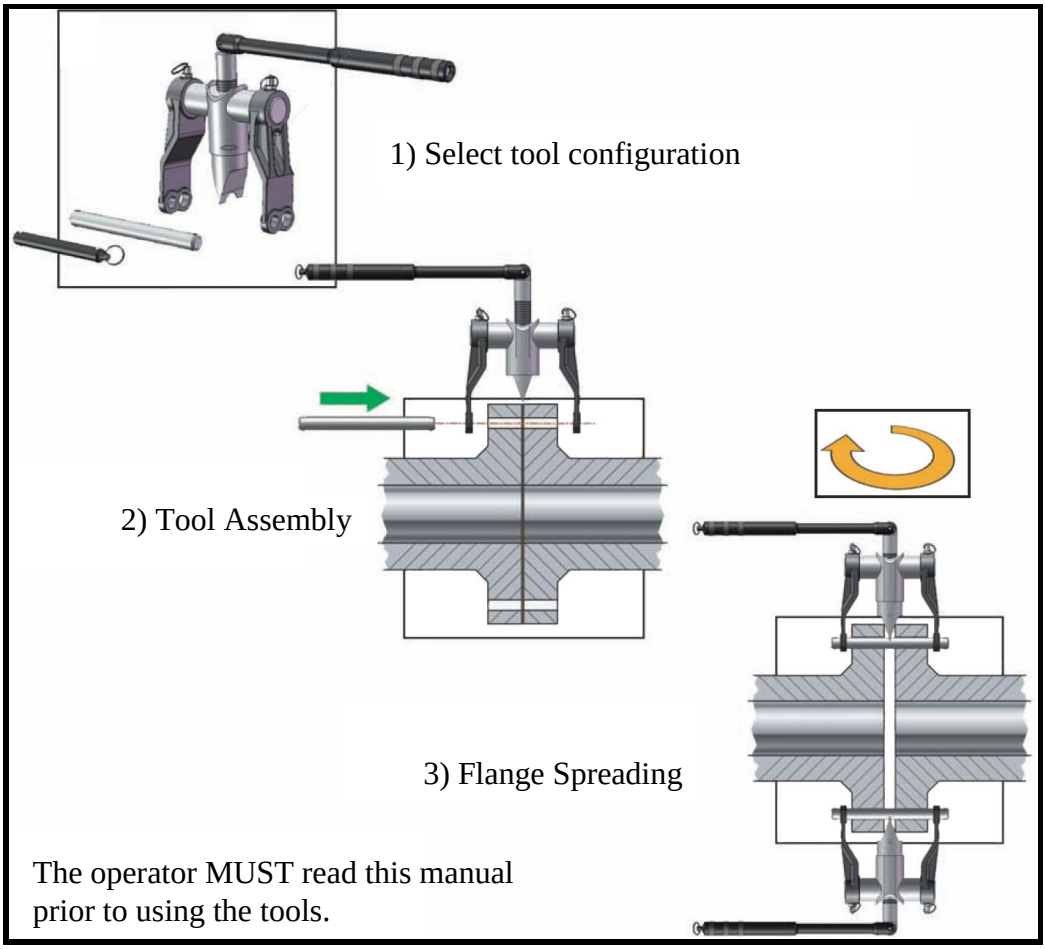
CAUTION: Do not operate the equipment without lubricating all moving parts. Use only high pressure molybdenum disulphide grease.

3 – TECHNICAL DATA

	SPREADING FORCE
WC7TM	6.8 T (68 kN) per tool It is recommended that tools are used in pairs giving 2 x 6.8 = 13.6 T (136 kN)

The tool achieves a spreading distance of 27mm from a 2mm gap. At a 7mm gap the tool steps down the spreading force applied from 6.8 tonnes to 3.9 tonnes.

4 – HOW THE FLANGE SPREADING WEDGES WORK



5 – EXAMINATION, MAINTENANCE AND STORAGE

Before and after using any Christie tool, ensure the full kit is available and check for any damage or wear.

Any missing or damaged items are to be replaced as soon as possible, prior to the tool being used again.

Store in a cool dry place and ensure all machined surfaces are greased

Grease all moving parts prior to use

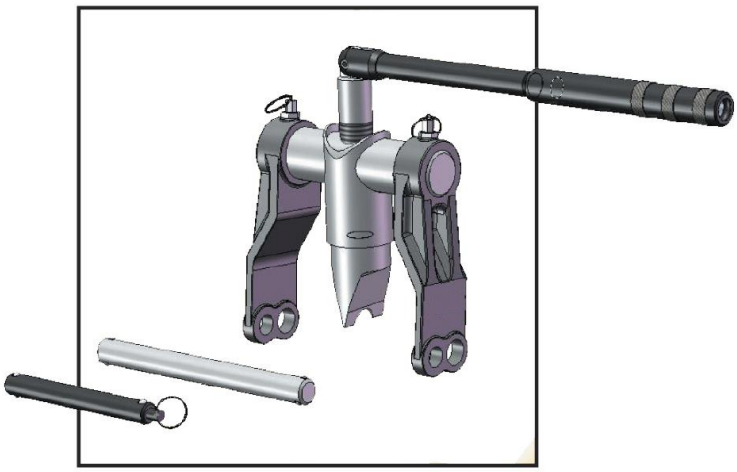
6.1 – KIT COMPONENTS

1 x WC7TM Tool

1 x 0 16mm (0.63”) Spreading Bar

1 x 0 20mm (0.79”) Spreading Bar

1 x Instruction Manual



6.2 – INSTALLATION AND OPERATION

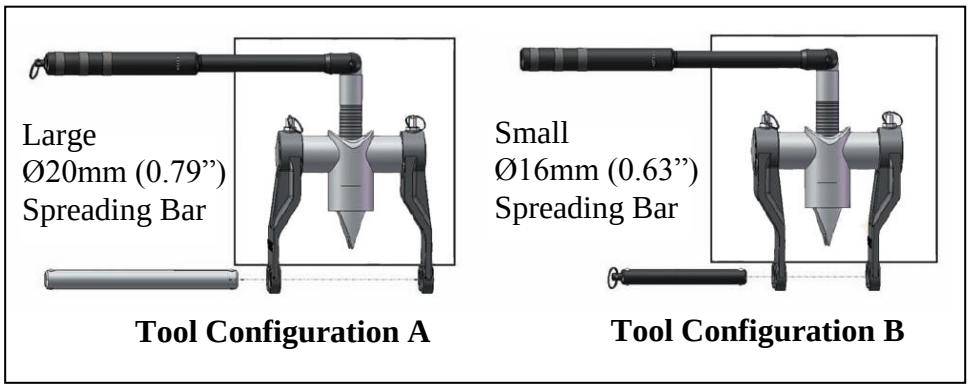
Before attaching the tool, ensure at least two flange bolts remain in place, 180 degrees apart, with nuts loosened sufficiently enough for flange work to be carried out. These bolts will reduce lateral flange movement during flange spreading and will help support the unit.

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.

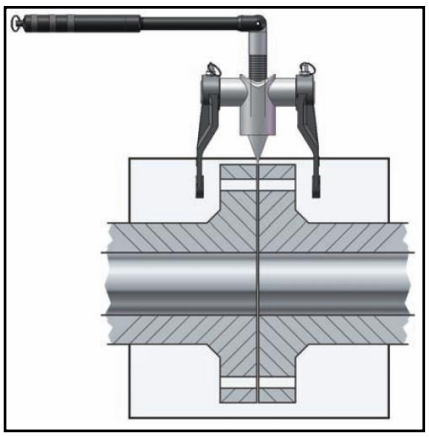
1) Choose the suitable configuration for the size and class of flange joint you wish to separate. See the application charts section

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

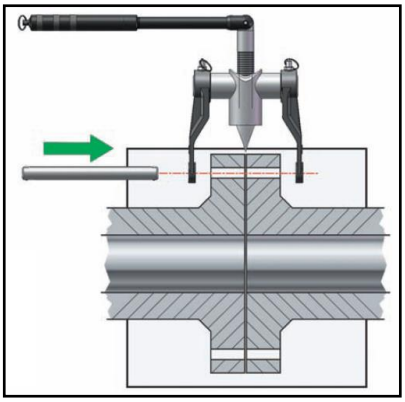


The flange bolting should be disassembled as per your company's procedures and risk assessment.

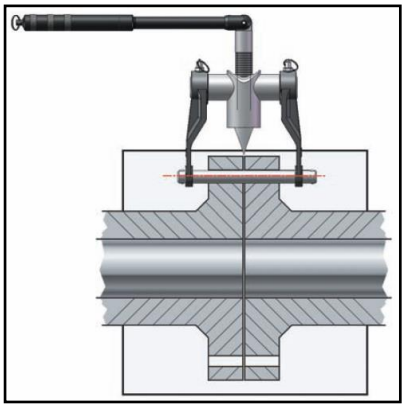
2) Place the tool over the flange joint and align with the desired stud hole.



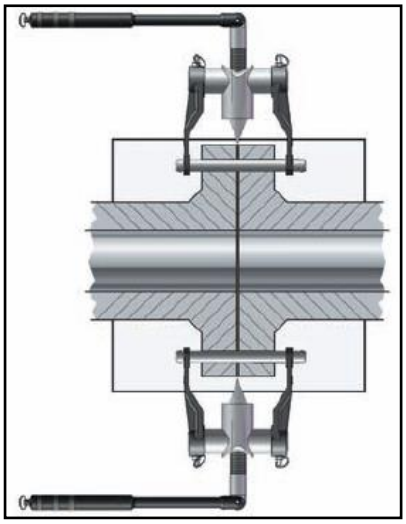
3) Engage the spreading bar through the leg of the tool and the flange stud hole.



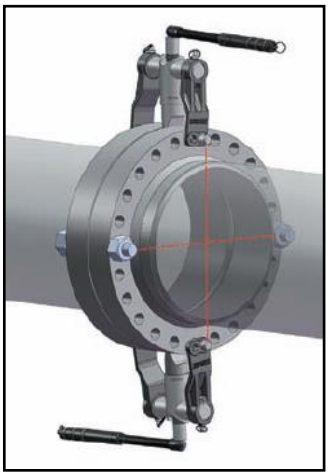
Do not hammer or use excessive force to fit the spreading bar. The bar should be fitted by hand.



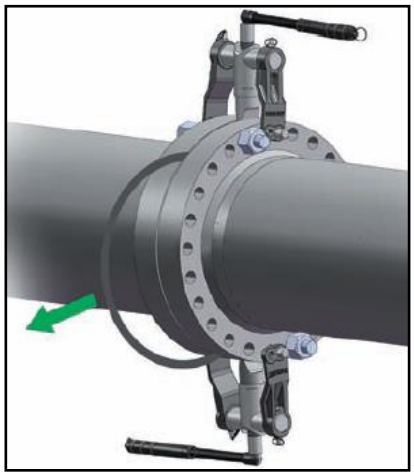
4) Take care to ensure the spreading bar is correctly fitted through the second leg of the tool. Check the wedge is positioned in the gap between the flange faces.



5) It is strongly recommended that two WC7TM Tools are used on the flange joint positioned 180 degrees apart.

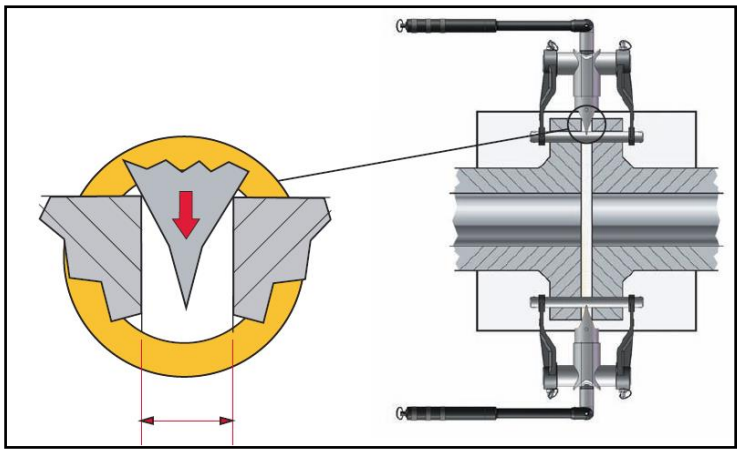


Flange Separation



Flange Spreading & Seal Removal

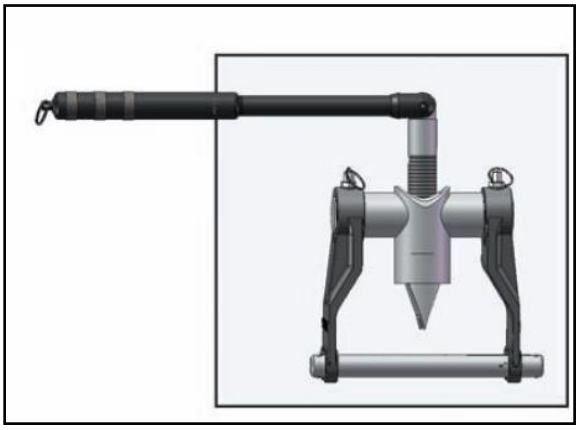
6) Turn each opposing tool a half turn at a time until the desired gap is achieved. Care must be taken to ensure the force is applied evenly. The maximum spreading distance for the WC7TM is 27mm.



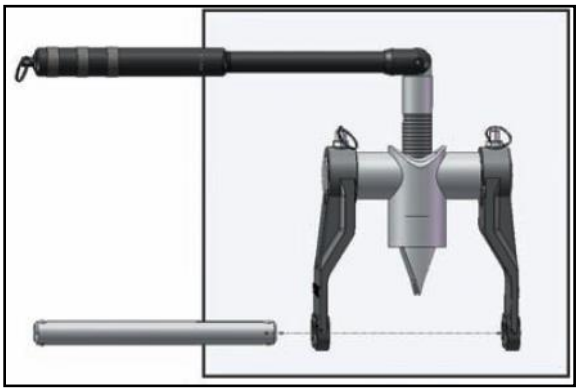
6.3 – MAINTENANCE AND LUBRICATION

Before and after each job, the Christie 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.

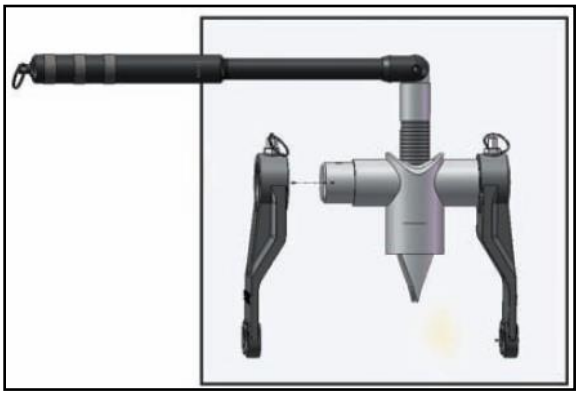
At regular intervals, and specifically after being exposed to salt water, Mini-Gap mechanical tools should be dismantled and lubricated as follows:



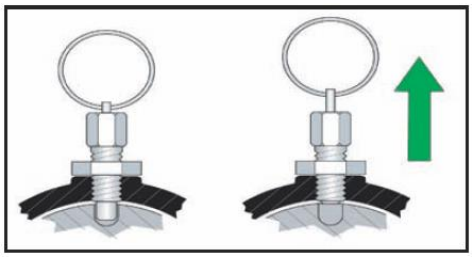
1) Lay the tool on a bench or flat surface with the right hand side face down.

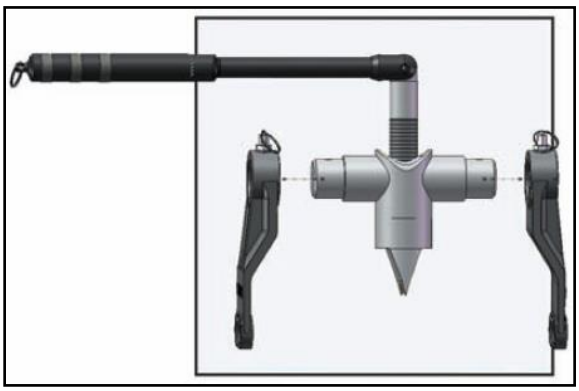


2) Pull the spreading bar out of the tool.



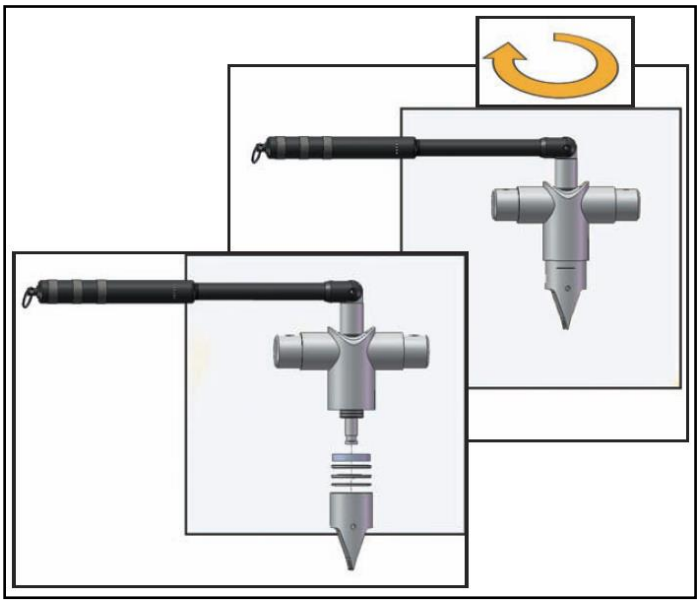
3) To Remove the left hand cast leg from the tool. Pull the spring loaded plunger to release the leg.



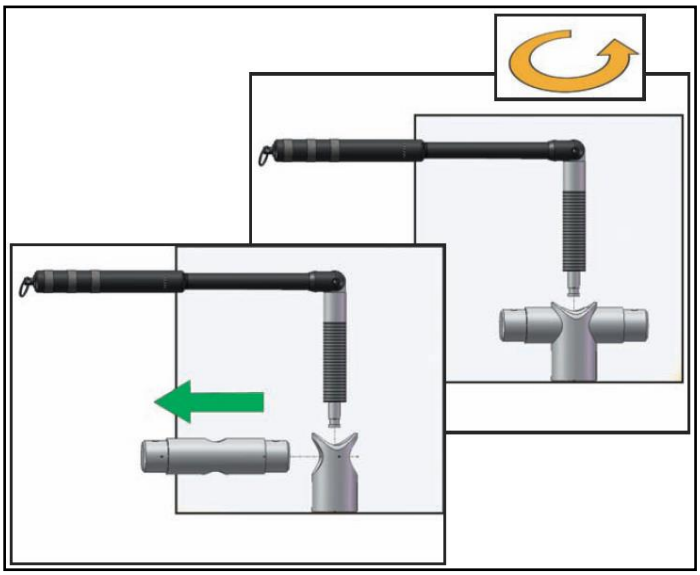


4) Remove the right hand cast leg from the tool.

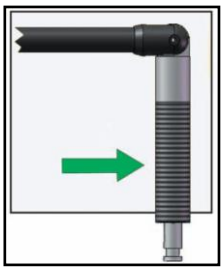
5) Drive the handle so that the splitter wedge moves down. Then remove the Splitter wedge and Thrust bearing from the tool.



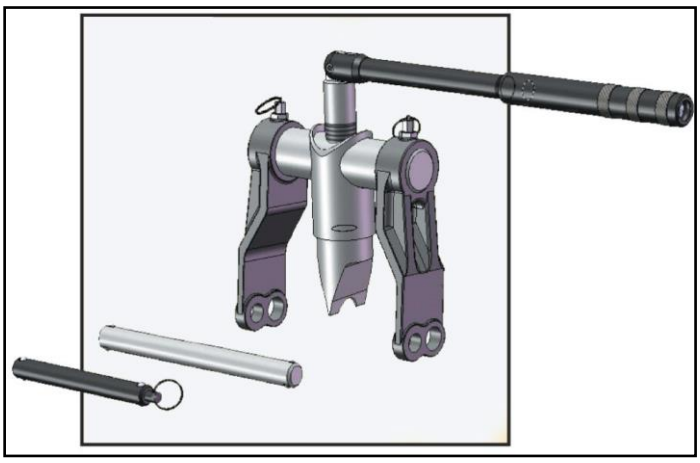
6) Fully unscrew the drive screw. Remove the main body and the outer sleeve from the tool.



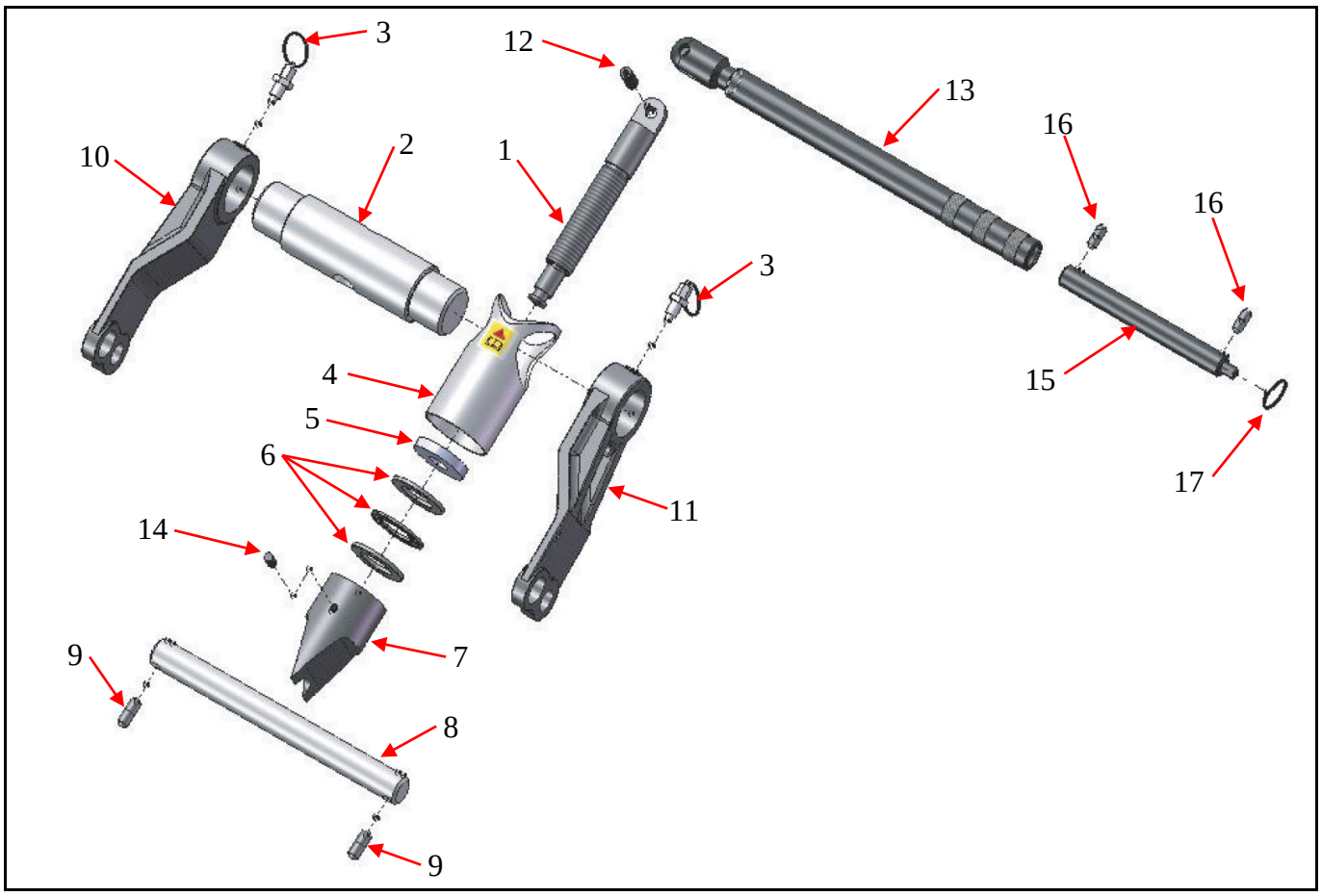
7) Apply grease to the drive screw. Clean all components and inspect for wear and damage. Replace all worn and damaged components with genuine Christie spares.



8) Reassemble by reversing the disassembly procedure (steps 2 to 7).



6.4 – PARTS LIST



ITEM	PART No:	DESCRIPTION	QUANTITY
1	740701	Drive Screw	1
2	740301	Main Body	1
3	632001	Small Plunger	2
4	740901	Outer Sleeve	1
5	742001	Bearing Washer	1
6	301601	Thrust Bearing Set	1
7	740401	Splitter Wedge	1
8	740501	Large Spreading Bar	1
9	741101	8mm Plunger	2
10	740101	Cast Leg Left Hand	1
11	740201	Cast Leg Right Hand	1
12	743101	Coiled Spring Pin	1
13	740801	Handle	1
14	301301	Grub Screw	1
15	740601	Small Spreading Bar	1
16	742101	7mm Plunger	2
17	744101	Plunger Ring	1

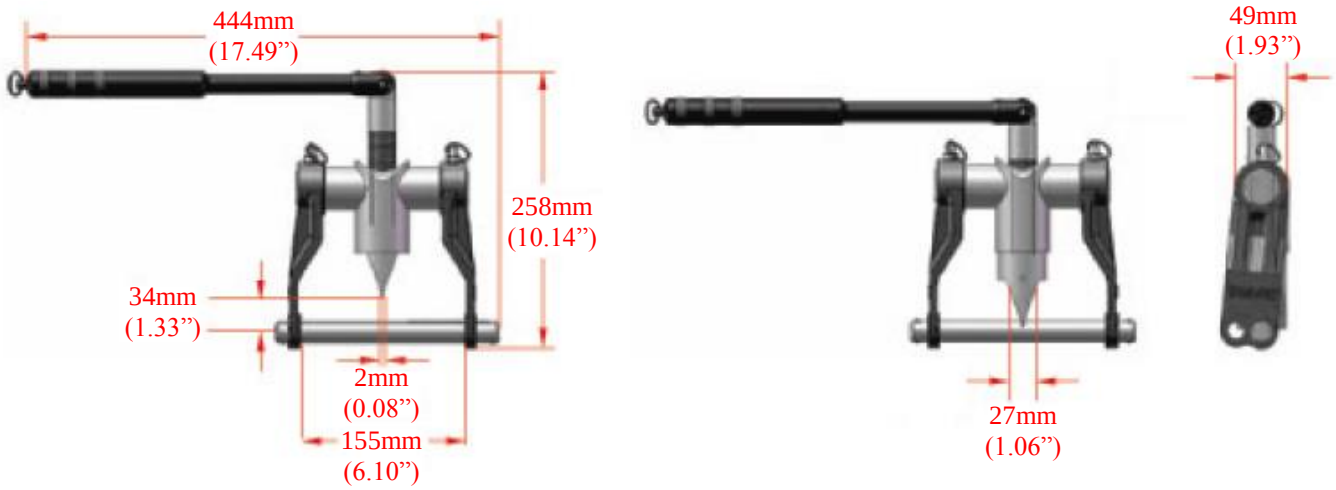
6.5 – WEIGHTS AND DIMENSIONS

WC7TM MINI-GAP FLANGE SPREADER = 5 kg (11.05 lbs)

GROSS KIT WEIGHT = 5.5 kg (12.13 lbs)

Packaging Dimensions: 60 x 270 x 300 mm (7.48” x 7.09” x 12.60”)

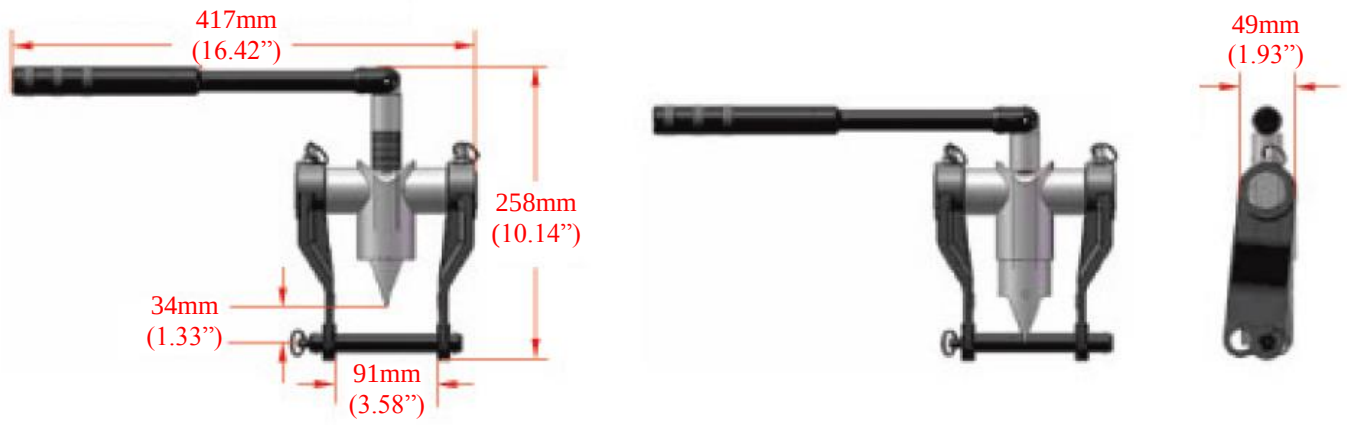
Large – Ø20mm (0.79”) Spreading Bar



Small – Ø16mm (0.63”) Spreading Bar

Tool Configuration 2

Tool Configuration 2



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.

Flange Type		Page
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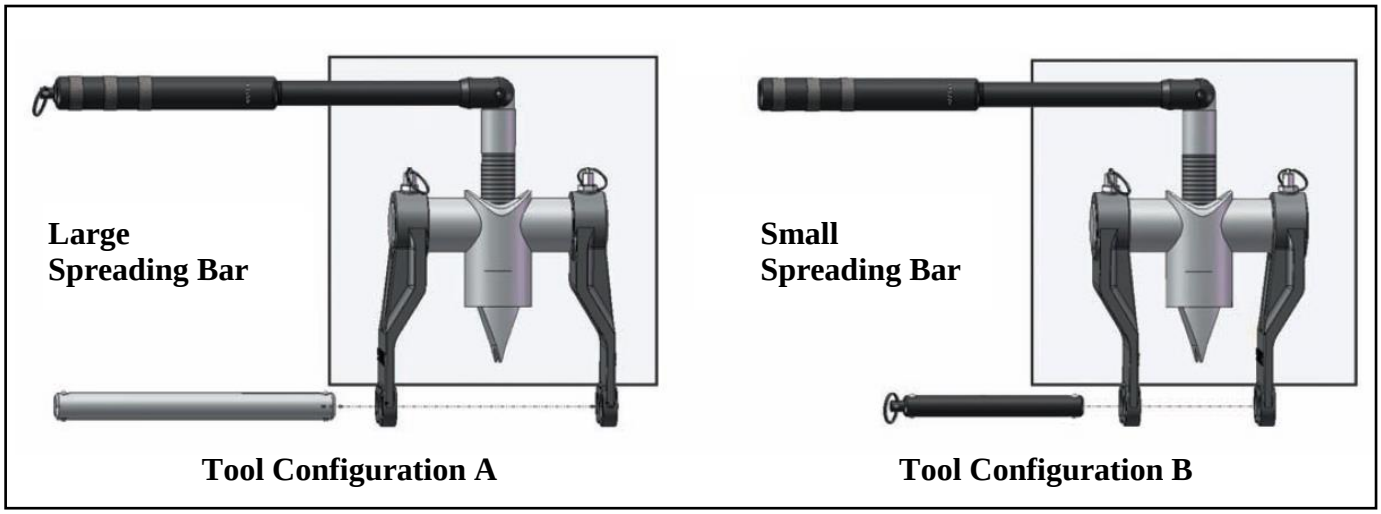
BS 10		14



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					
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		
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

NPS	Class 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 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 Reducing

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	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 – 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

BS10

NPS	Table									
	A	D	E	F	H	J	K	R	S	T
1/2"	Small Bar	Small Bar	Small Bar	Small Bar	Small Bar	Small Bar	Small Bar	Small Bar	Large Bar	Large Bar
3/4"	Small Bar	Small Bar	Small Bar	Small Bar	Small Bar	Small Bar	Small Bar	Small Bar	Large Bar	Large Bar
1”	Small Bar	Small Bar	Small Bar	Small Bar	Small Bar	Small Bar	Small Bar	Small Bar	Large Bar	Large Bar
1-1/4”	Small Bar	Small Bar	Small Bar	Small Bar	Small Bar	Large Bar	Large Bar	Large Bar	Large Bar	Large Bar
1-1/2”	Small Bar	Small Bar	Small Bar	Small Bar	Small Bar	Large Bar	Large Bar	Large Bar	Large Bar	Large Bar
2”	Small Bar	Small Bar	Small Bar	Small Bar	Small Bar	Large Bar	Large Bar	Large Bar	Large Bar	Large Bar
2-1/2”	Small Bar	Small Bar	Small Bar	Small Bar	Small Bar	Large Bar	Large Bar	Large Bar	Large Bar	Large Bar
3”	Small Bar	Small Bar	Small Bar	Small Bar	Small Bar	Large Bar	Large Bar	Large Bar	Large Bar	Large Bar
3-1/2”	Small Bar	Small Bar	Small Bar	Small Bar	Small Bar	Large Bar	Large Bar	Large Bar	Large Bar	Large Bar
4”	Small Bar	Small Bar	Small Bar	Small Bar	Small Bar	Large Bar	Large Bar	Large Bar	Large Bar	Large Bar
5”	Large Bar	Large Bar	Large Bar	Large Bar	Large Bar	Large Bar	Large Bar	Large Bar	Large Bar	Large Bar
6”	Large Bar	Large Bar	Large Bar	Large Bar	Large Bar	Large Bar	Large Bar	Large Bar	Large Bar	Large Bar
7”	Large Bar	Large Bar	Large Bar	Large Bar	Large Bar	Large Bar	Large Bar	Large Bar	Large Bar	
8”	Large Bar	Large Bar	Large Bar	Large Bar	Large Bar	Large Bar	Large Bar	Large Bar	Large Bar	
9”	Large Bar	Large Bar	Large Bar	Large Bar	Large Bar	Large Bar	Large Bar	Large Bar	Large Bar	
10”	Large Bar	Large Bar	Large Bar	Large Bar	Large Bar	Large Bar	Large Bar	Large Bar	Large Bar	
12”	Large Bar	Large Bar	Large Bar	Large Bar	Large Bar	Large Bar	Large Bar	Large Bar		
13”	Large Bar	Large Bar	Large Bar	Large Bar	Large Bar	Large Bar	Large Bar	Large Bar		
14”	Large Bar	Large Bar	Large Bar	Large Bar	Large Bar	Large Bar	Large Bar	Large Bar		
15”	Large Bar	Large Bar	Large Bar	Large Bar	Large Bar	Large Bar	Large Bar	Large Bar		
16”	Large Bar	Large Bar	Large Bar	Large Bar	Large Bar	Large Bar	Large Bar	Large Bar		
17”	Large Bar	Large Bar	Large Bar	Large Bar	Large Bar	Large Bar	Large Bar			
18”	Large Bar	Large Bar	Large Bar	Large Bar	Large Bar	Large Bar	Large Bar			
19”	Large Bar	Large Bar	Large Bar	Large Bar	Large Bar	Large Bar				
20”	Large Bar	Large Bar	Large Bar	Large Bar	Large Bar	Large Bar				
21”	Large Bar	Large Bar	Large Bar	Large Bar	Large Bar	Large Bar				
22”	Large Bar	Large Bar	Large Bar	Large Bar	Large Bar	Large Bar				
23”	Large Bar	Large Bar	Large Bar	Large Bar	Large Bar	Large Bar				
24”	Large Bar	Large Bar	Large Bar	Large Bar	Large Bar	Large Bar				
26”	Large Bar	Large Bar	Large Bar	Large Bar						
27”	Large Bar	Large Bar	Large Bar	Large Bar						
29”	Large Bar	Large Bar	Large Bar	Large Bar						
30”	Large Bar	Large Bar	Large Bar	Large Bar						
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								

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E.C. DECLARATION OF CONFORMITY

MODEL COVERED: WC7TM

DESCRIPTION: Mini-Gap Flange Spreader

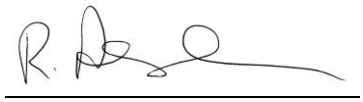
We hereby declare that the following machinery complies with the essential health and safety requirements of the European Machinery Directive 2006/42/EC published on the 9th June 2006

W Christie (Industrial) Ltd, Meadowbank Road, Rotherham S61 2NF, United Kingdom.

This machinery has been designed and manufactured in accordance with the following transposed harmonised European Standard:-

BS EN ISO 12100-1:2003 Safety of Machinery – Basic Terminology, Methodology

BS EN ISO 12100-2:2003 Safety of Machinery – Technical Principles

SIGNED: 

NAME: R. G. Askham **POSITION:** Senior Applications Engineer

On behalf of W Christie (Industrial) Ltd

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