



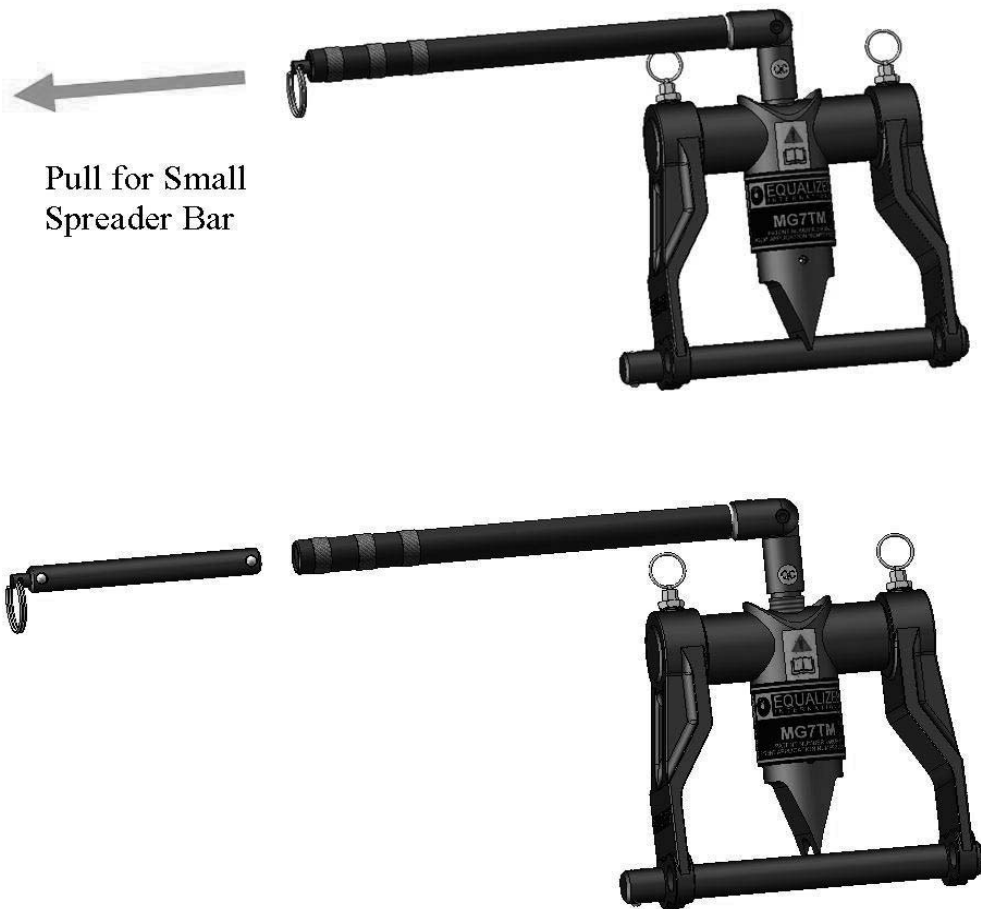
MG7TM

MINI-GAP FLANGE SPREADER

Operator Instruction Manual



EQUALIZERTM
INTERNATIONAL



Pull for Small
Spreader Bar

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INNOVATION IN ITS MOST FUNCTIONAL FORM



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1. INTRODUCTION

The Equalizer MG7™ 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 Equalizer MG7™ 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.

Equalizer International Ltd cannot be responsible for damage or injury resulting from unsafe product use, lack of maintenance or incorrect product and/or system operation. Contact Equalizer International Ltd 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 EQUALIZER MG7™ 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 mechanical equipment. The operator must have read and understood all instructions, safety issues, cautions and warnings before starting to operate the Equalizer 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 Equalizer parts. Equalizer parts are designed to fit properly and withstand rated loads. For repair or maintenance service contact your Equalizer distributor or service centre.



DANGER: To avoid personal injury keep hands and feet away 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 hole; 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.

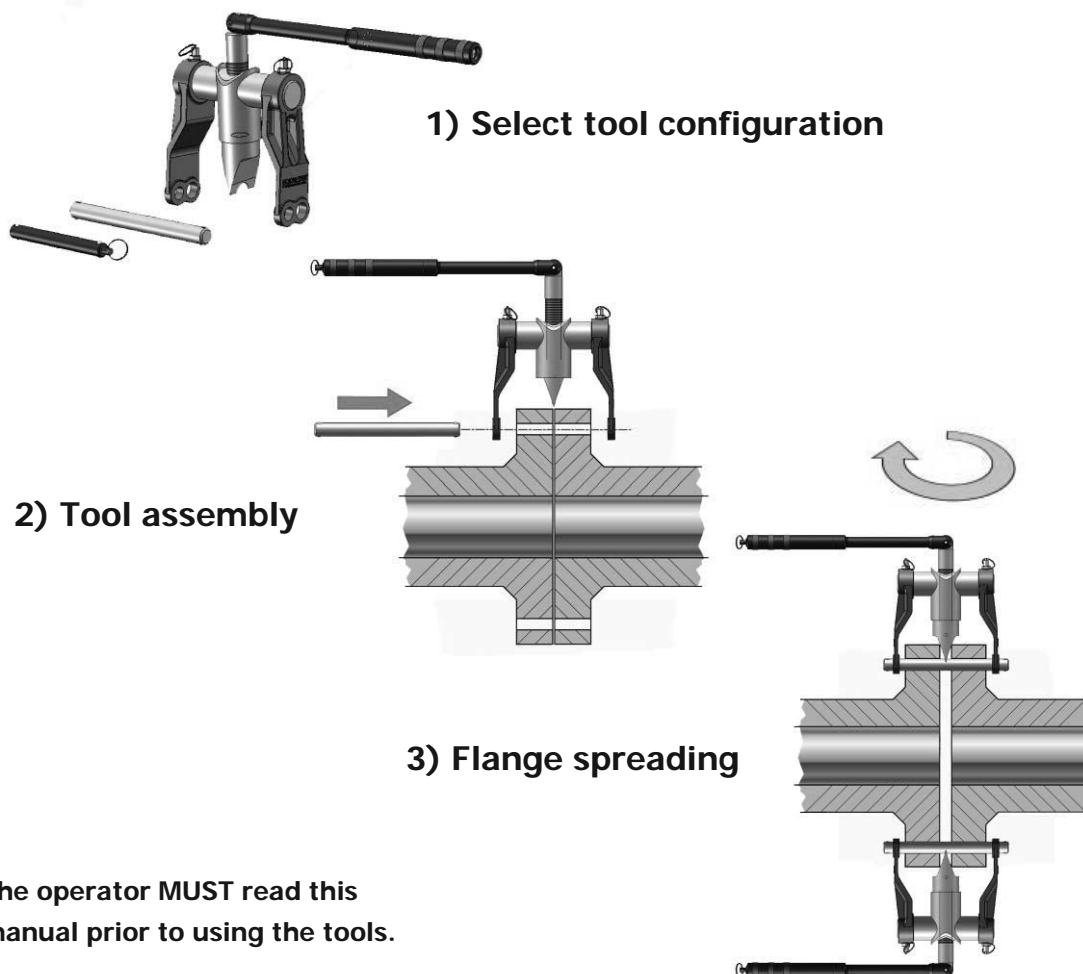


3. TECHNICAL DATA

| | Spreading Force |
|-----------------|---|
| MG7TMSTD | 6.8 T (68 kN) per tool It is recommended that tools are used in pairs giving $2 \times 6.8 = 13.6 \text{ T (136 kN)}$ |

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



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



5. EXAMINATION, MAINTENANCE AND STORAGE

Before and after using any Equalizer 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

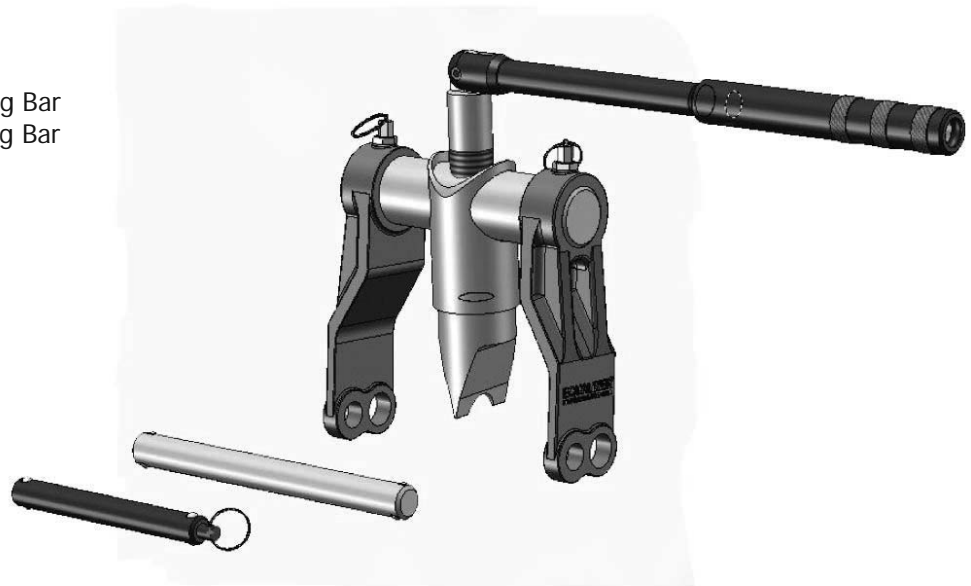
Grease all moving parts prior to use

6. MG7™ MINI-GAP FLANGE SPREADER

6.1 KIT COMPONENTS

- 1 x MG7™ Tool
- 1 x Ø 16mm (0.63") Spreading Bar
- 1 x Ø 20mm (0.79") Spreading Bar
- 1 x Instruction Manual

Product Code: MG7™STD





6.2 INSTALLATION AND OPERATION

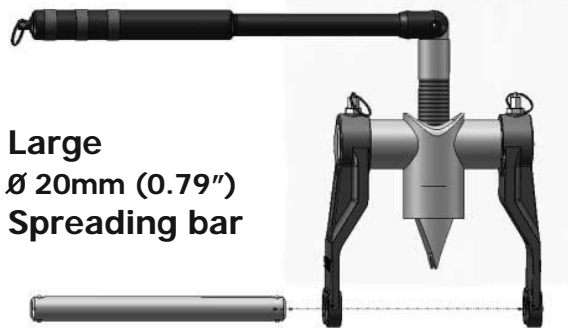


Before attaching the tool, ensure at least two flange bolts remain in place, 180 degrees apart, with nuts loosened sufficiently enough for flange work to be carried out. These bolts will reduce lateral flange movement during flange spreading and will help support the unit.



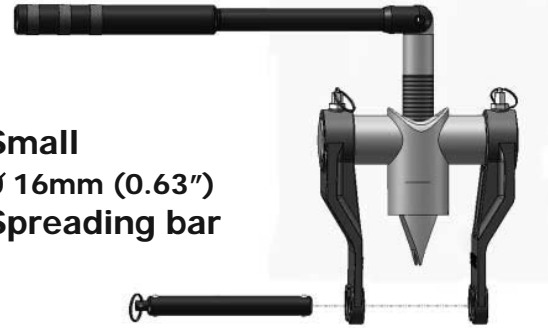
Do not extend the handle or use the smaller spreading bar as an extension bar.

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.



Large
Ø 20mm (0.79")
Spreading bar

Tool Configuration 1



Small
Ø 16mm (0.63")
Spreading bar

Tool Configuration 2

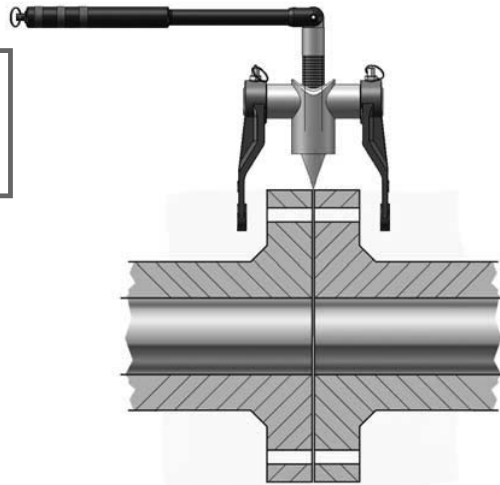
2. Choose the suitable configuration for the size and class of flange joint you wish to separate. See the application charts found on page 14 - 19 of this manual.

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.

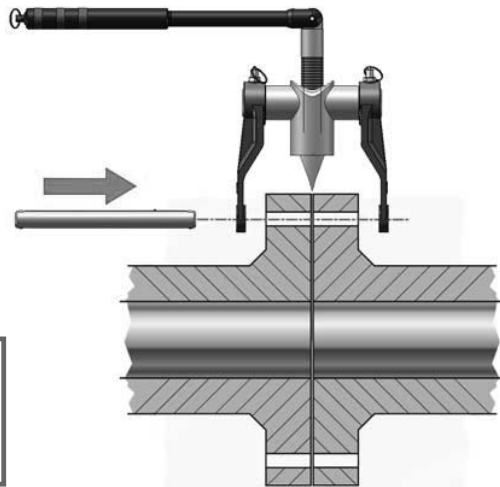
3. Place the tool over the flange joint and align with the desired stud hole.



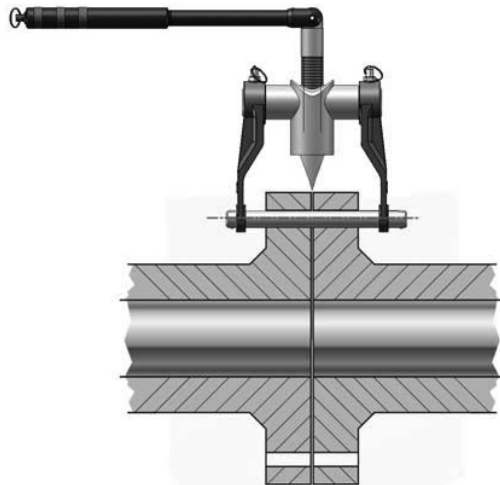
4. Engage the spreading bar through the leg of the tool and the flange stud hole.



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

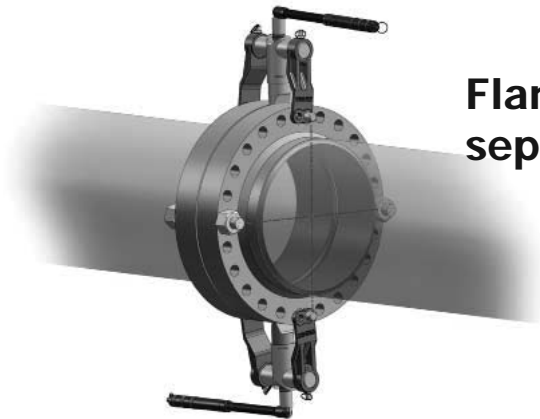


5. Take care to ensure the spreading bar is correctly fitted through the second leg of the tool. Check the wedge is positioned in the gap between the flange faces.

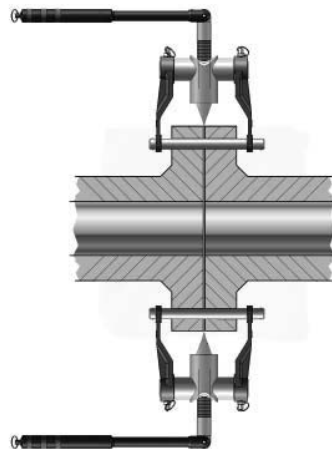




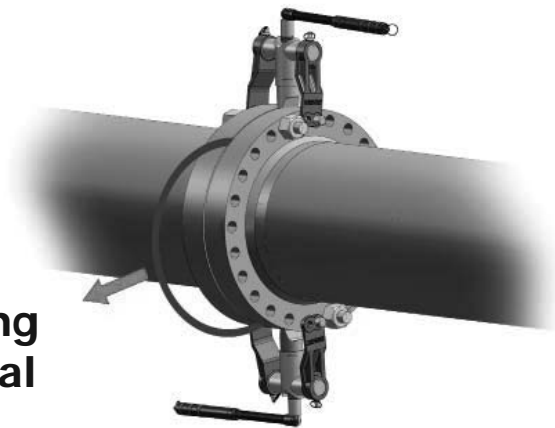
6. It is strongly recommended that two MG7™ Tools are used on the flange joint positioned 180 degrees apart.



Flange separation

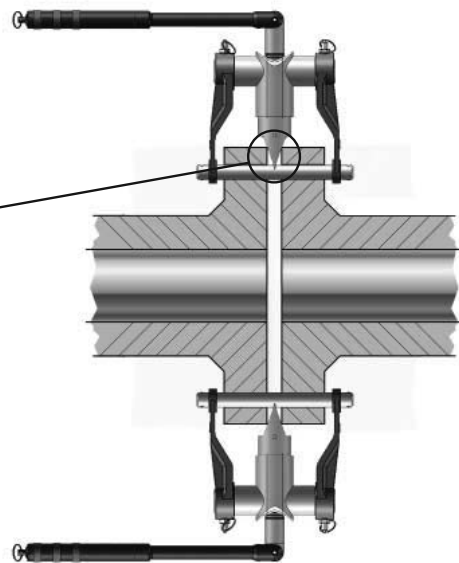
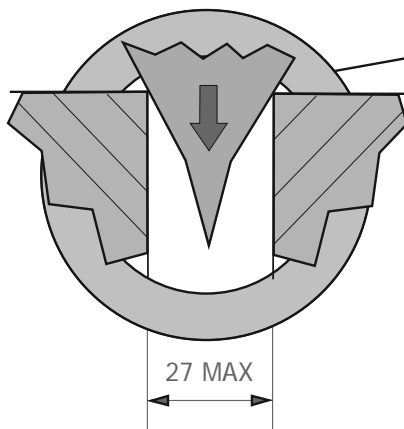


Flange spreading and seal removal



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 MG7™ is 27mm.





6.3 MAINTENANCE AND LUBRICATION

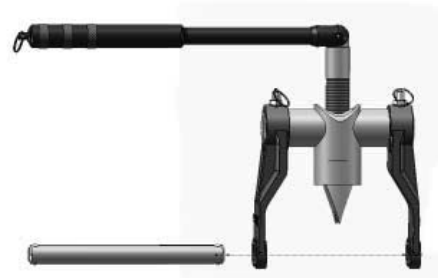
Before and after each job, the Equalizer Mini-Gap mechanical tool kit must be checked to establish that they are complete and all items must be examined to ensure that they are serviceable.

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

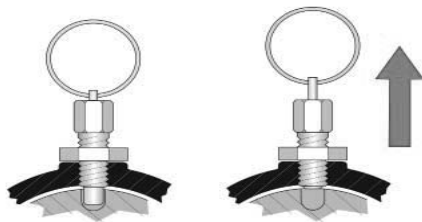
1. Lay the tool on a bench or flat surface with the right hand side face down.



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.

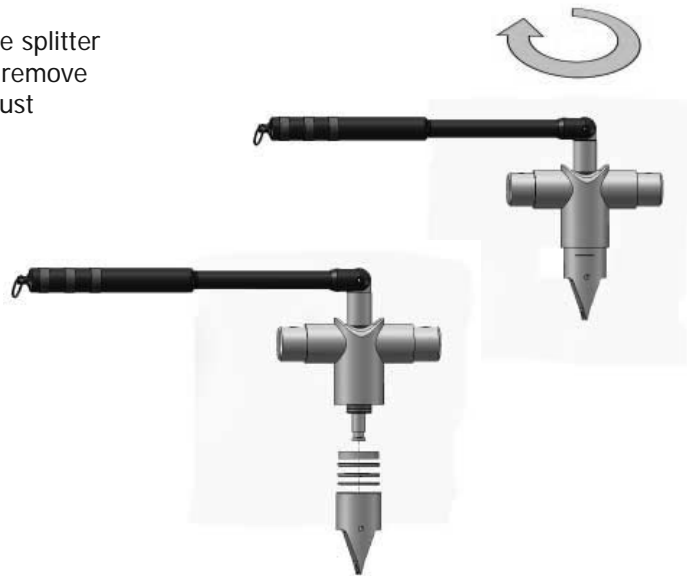


4. Remove the right hand cast leg from the tool.

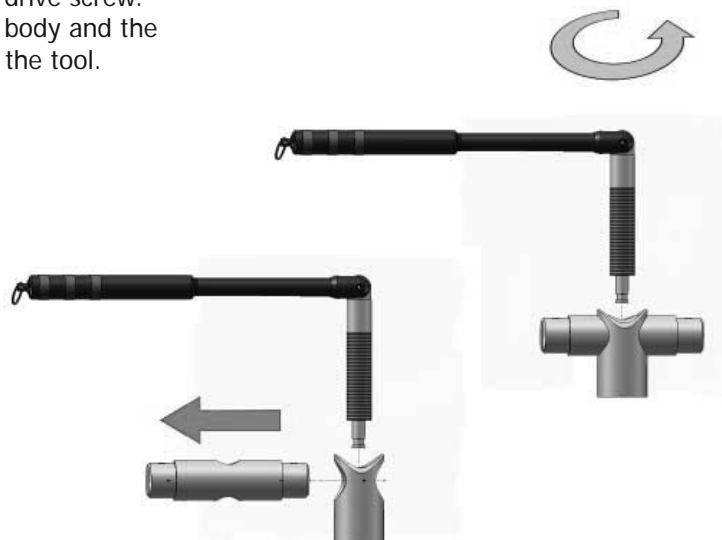




-
- 5.** Drive the handle so that the splitter wedge moves down. Then remove the Splitter wedge and Thrust bearing from the tool.

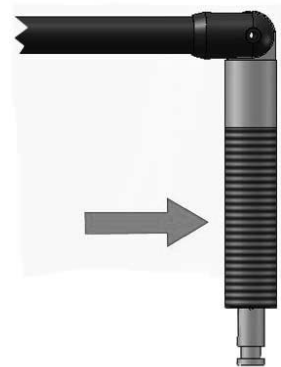


-
- 6.** Fully unscrew the drive screw. Remove the main body and the outer sleeve from the tool.





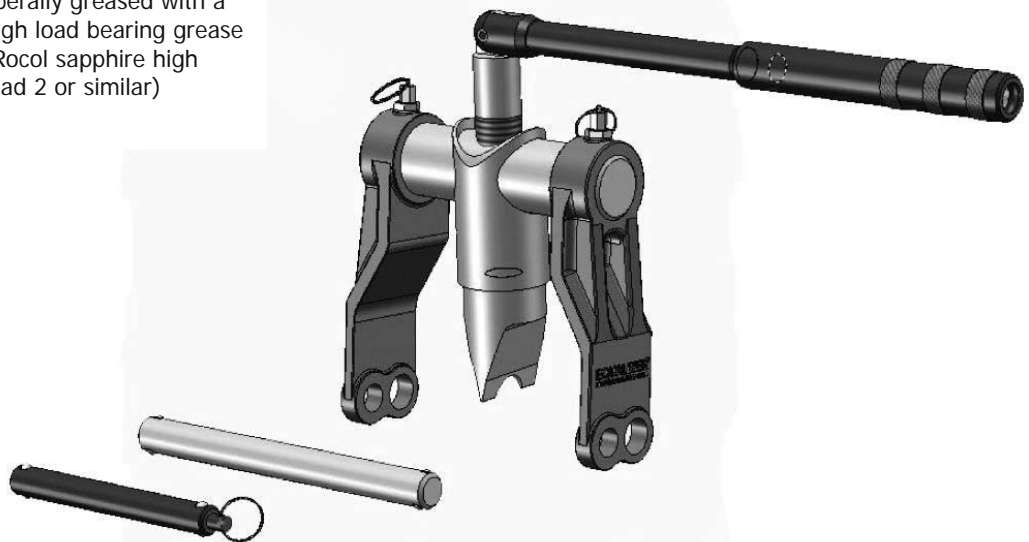
7. Apply grease to the drive screw. Clean all components and inspect for wear and damage. Replace all worn and damaged components with genuine Equalizer spares.



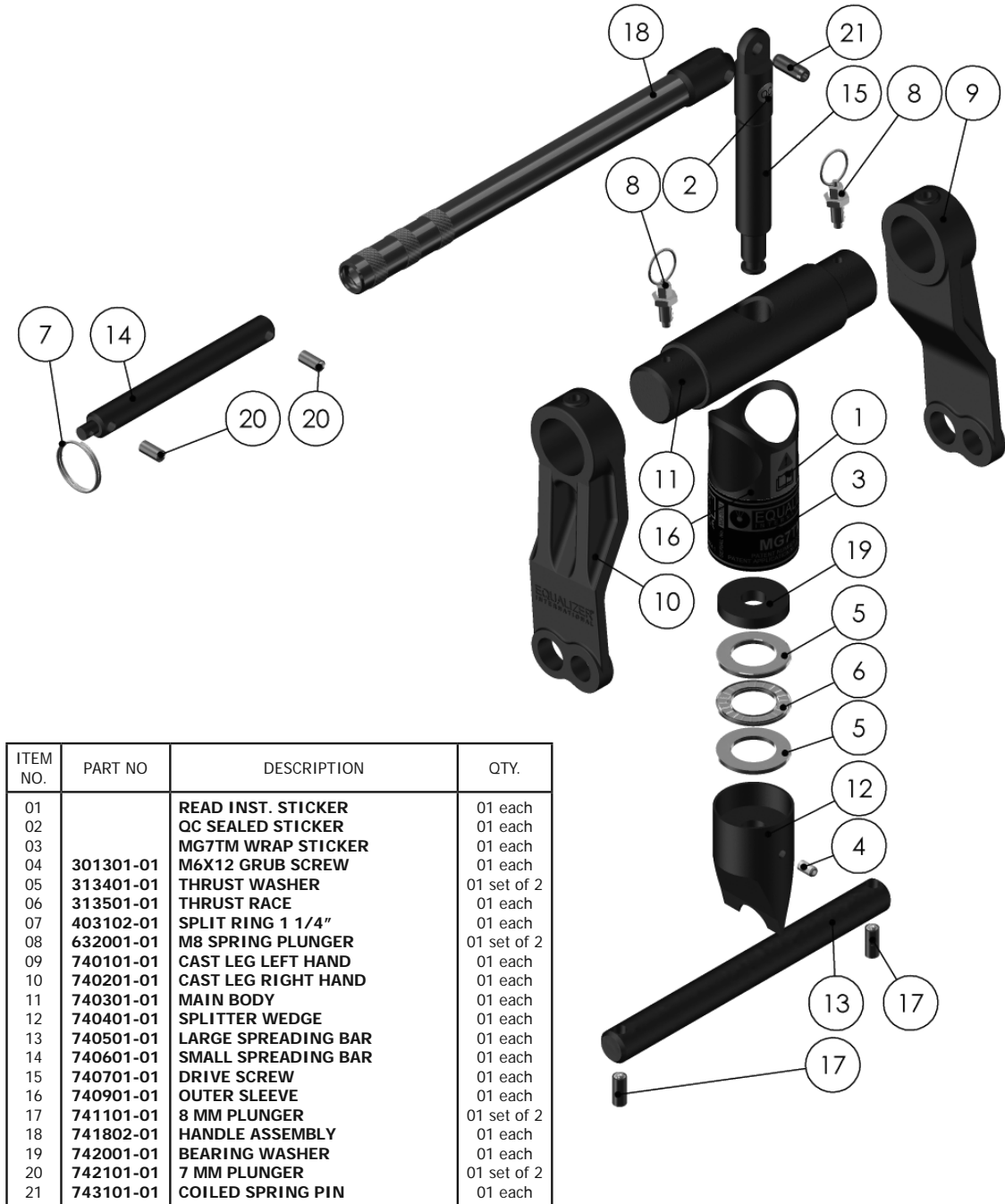
8. Reassemble by reversing the disassembly procedure (steps 2 to 7).



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 (Rocol sapphire high load 2 or similar)



6.3 PARTS LIST



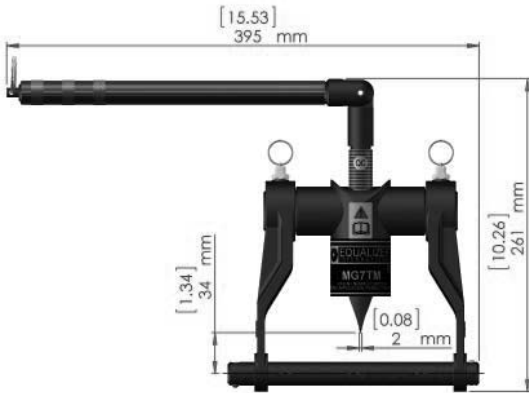
| ITEM NO. | PART NO | DESCRIPTION | QTY. |
|----------|-----------|---------------------|-------------|
| 01 | | READ INST. STICKER | 01 each |
| 02 | | QC SEALED STICKER | 01 each |
| 03 | | MG7™ WRAP STICKER | 01 each |
| 04 | 301301-01 | M6X12 GRUB SCREW | 01 each |
| 05 | 313401-01 | THRUST WASHER | 01 set of 2 |
| 06 | 313501-01 | THRUST RACE | 01 each |
| 07 | 403102-01 | SPLIT RING 1 1/4" | 01 each |
| 08 | 632001-01 | M8 SPRING PLUNGER | 01 set of 2 |
| 09 | 740101-01 | CAST LEG LEFT HAND | 01 each |
| 10 | 740201-01 | CAST LEG RIGHT HAND | 01 each |
| 11 | 740301-01 | MAIN BODY | 01 each |
| 12 | 740401-01 | SPLITTER WEDGE | 01 each |
| 13 | 740501-01 | LARGE SPREADING BAR | 01 each |
| 14 | 740601-01 | SMALL SPREADING BAR | 01 each |
| 15 | 740701-01 | DRIVE SCREW | 01 each |
| 16 | 740901-01 | OUTER SLEEVE | 01 each |
| 17 | 741101-01 | 8 MM PLUNGER | 01 set of 2 |
| 18 | 741802-01 | HANDLE ASSEMBLY | 01 each |
| 19 | 742001-01 | BEARING WASHER | 01 each |
| 20 | 742101-01 | 7 MM PLUNGER | 01 set of 2 |
| 21 | 743101-01 | COILED SPRING PIN | 01 each |

6.4 WEIGHTS AND DIMENSIONS

| | |
|--|----------------------|
| MG7TM 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 $\phi 20\text{mm}$ (0.79") spreading bar

**TOOL CONFIGURATION 1
OPEN**

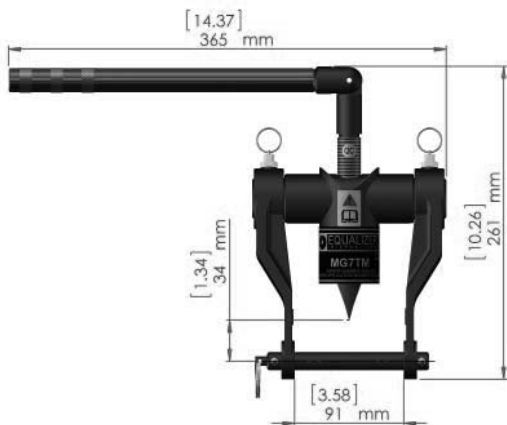


**TOOL CONFIGURATION 2
CLOSED**



Small $\phi 16\text{mm}$ (0.63") spreading bar

**TOOL CONFIGURATION 1
OPEN**



**TOOL CONFIGURATION 2
CLOSED**



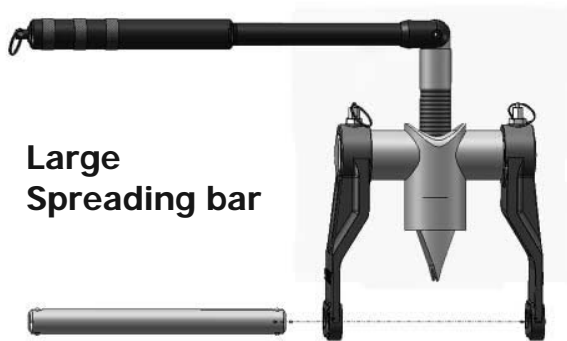


7. RANGE OF APPLICATION CHARTS

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 | → | see page 15 |
| | B16.5 Socket welded | → | see page 15 |
| | B16.5 Long welding neck flange | → | see page 16 |
| | B16.5 Lapped flange | → | see page 16 |
| | B16.47 Weldneck and Blind flanges | → | see page 17 |
| ANSI | Reducing | → | see page 17 |
| | Orifice - Weldneck flange | → | see page 18 |
| | Orifice - Slip-on and Threaded flanges | → | see page 18 |
| BS 10 | | → | see page 19 |



**Large
Spreading bar**

Tool Configuration 1



**Small
Spreading bar**

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 |

