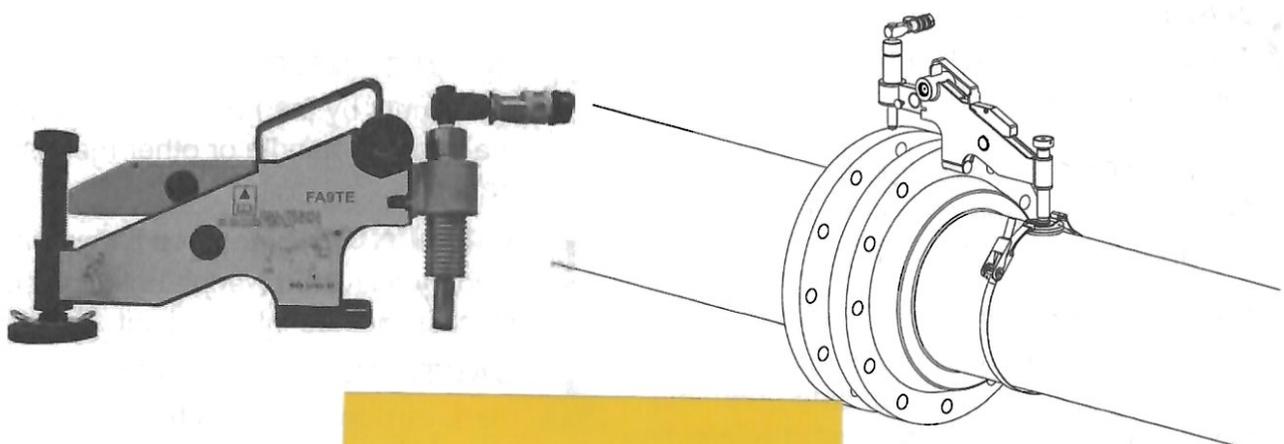


# OPERATING INSTRUCTIONS

## HYDRAULIC FLANGE

### ALIGNMENT TOOL

#### FA1TM, FA4TM, FA9TM & FA9TE



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English : E1~E26

中文  
English  
Ver.16

## 1. SAFETY ISSUES

 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 **SUPPLY** 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 **SUPPLY** parts. **SUPPLY** 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.

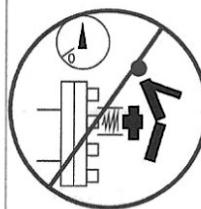
 **WARNING:** Never pressurize uncoupled couplers. Only use hydraulic equipment in a coupled system.

 **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.

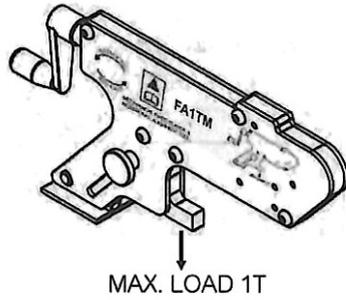
 **CAUTION:** Never hammer or force wedge to access gap.



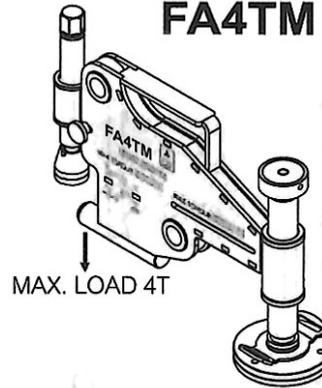
Never stand in-line with the bolt axis while tensioning or de-tensioning is in progress. If the bolt should fail, serious personal injury or death could result if loose or broken parts become projectiles. All personnel must be aware of this potential hazard at all times.

2. PRODUCT DESCRIPTION

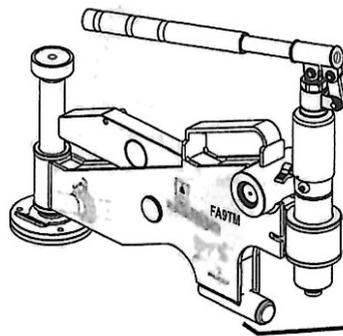
**FA1TM**



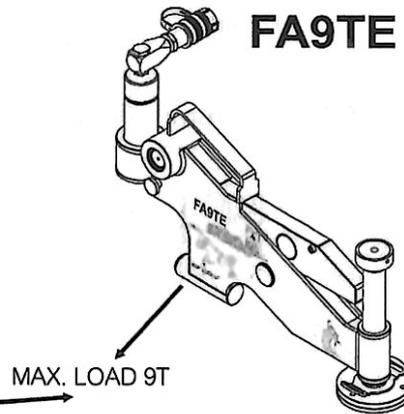
**FA4TM**



**FA9TM**



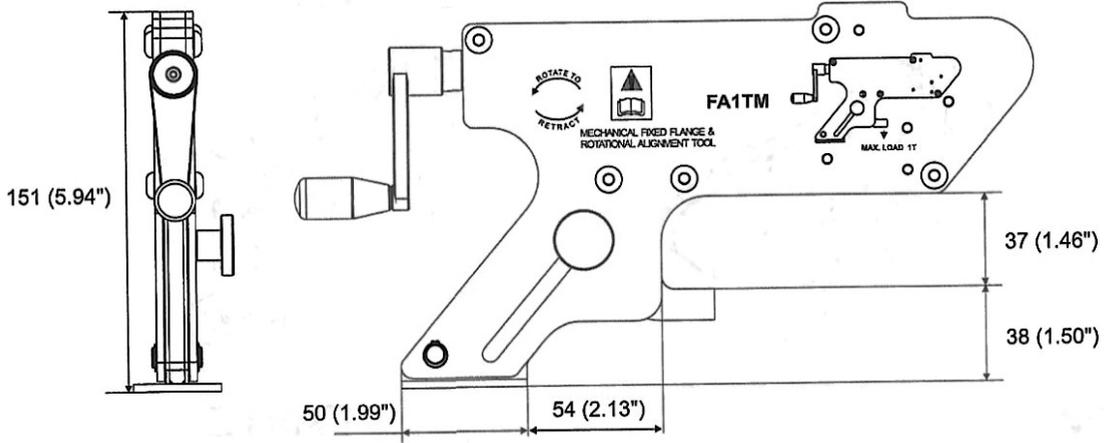
**FA9TE**



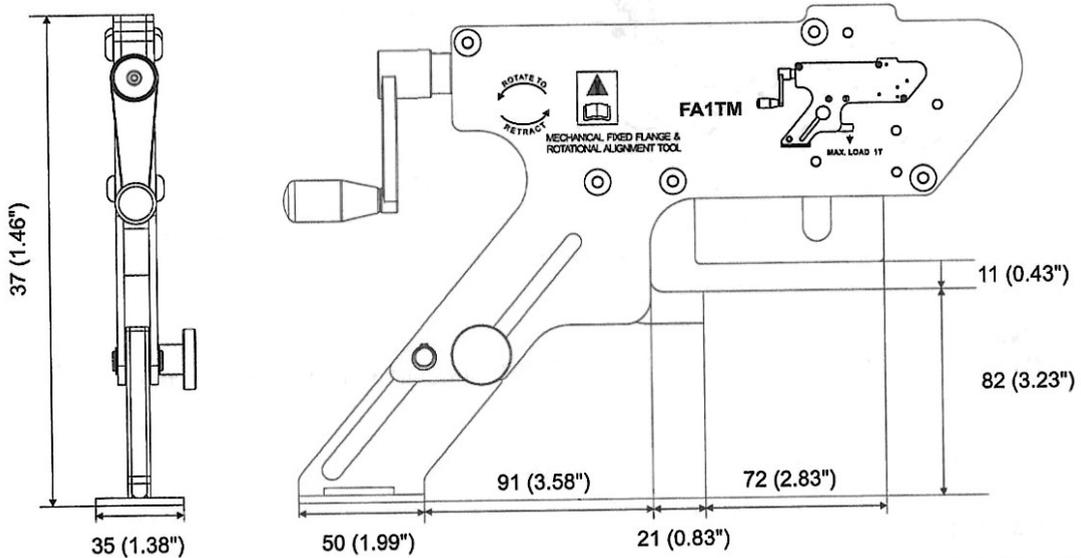
Model Number	Max. Lifting Force	Min. Bolt Size	Flange Wall Thickness (including gap between flanges)	Wt. ( kg )
	kN / ton		in / mm	
<b>FA1TM</b>	10/ 1	0.63 / 16	0.55 - 3.29 / 14 - 82	2.0
<b>FA4TM</b>	40/ 4	0.95 / 24	1.18 - 5.23 / 30 - 133	8.6
<b>FA9TM</b>	90/ 10	1.24 / 31.5	3.66 - 9.00 / 93 - 228	16.5
<b>FA9TE</b>	90/ 10	1.24 / 31.5	3.66 - 9.00 / 93 - 228	16.5

**2. PRODUCT DESCRIPTION**

Minimum extension FA 1TM in mm (inch)

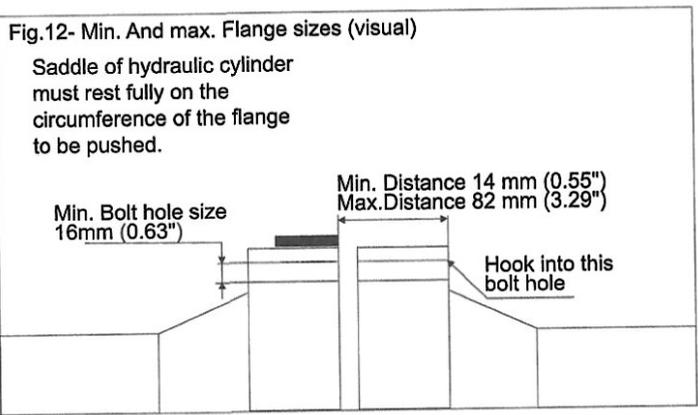


Maximum extension FSA-1TM in mm (inch)



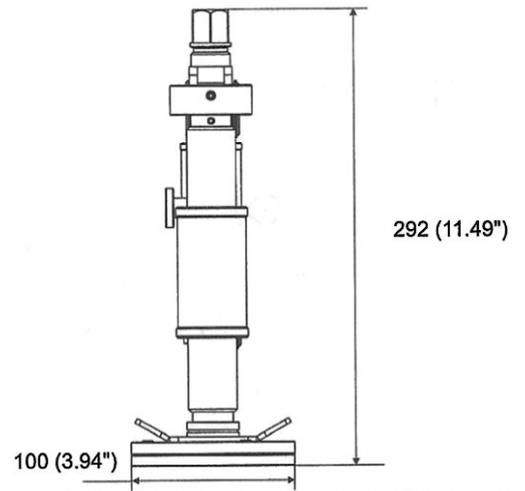
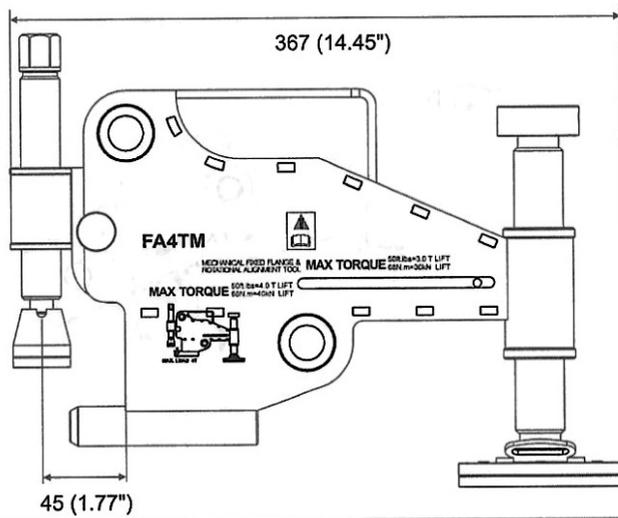
**APPLICATION RANGE:**

Two basic dimensions, A and B, will determine if the FA1TM can be used to align the joint. If the flange joint to be aligned is between 14mm(0.55 inch) and 82mm(3.29 inch) as illustrate by (A), has a bolt hole size of 16mm(0.63 inch) or greater (B), then the FA1TM can be attached and alignment achieved . See chart as below: by flange type, class and diameter.

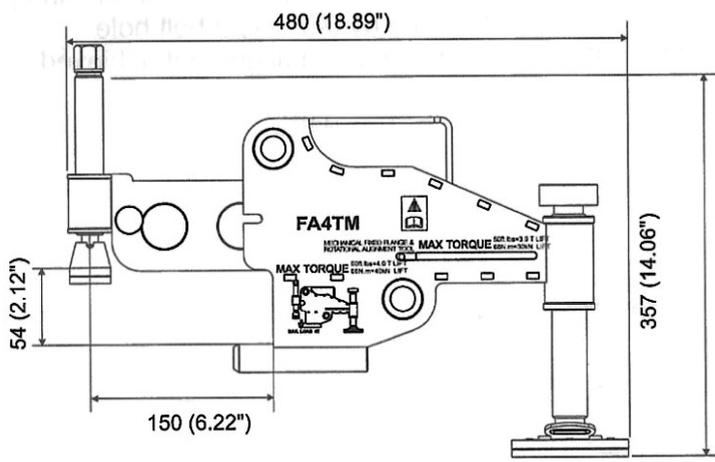


**2. PRODUCT DESCRIPTION**

**Minimum extension FA4TM in mm (inch)**

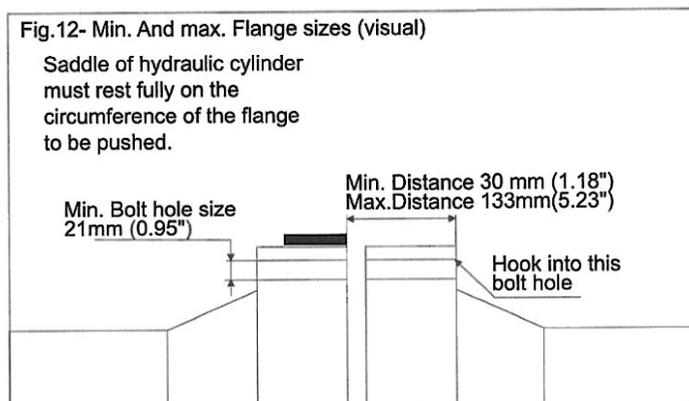


**Maximum extension FA4TM in mm (inch)**

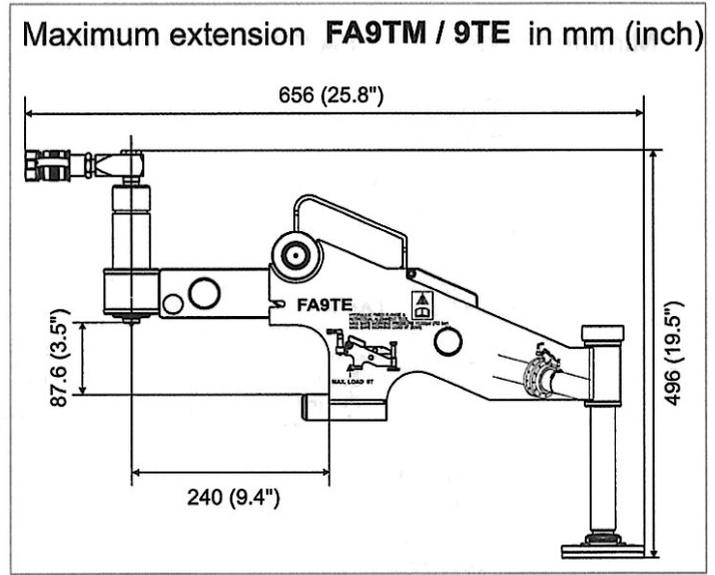
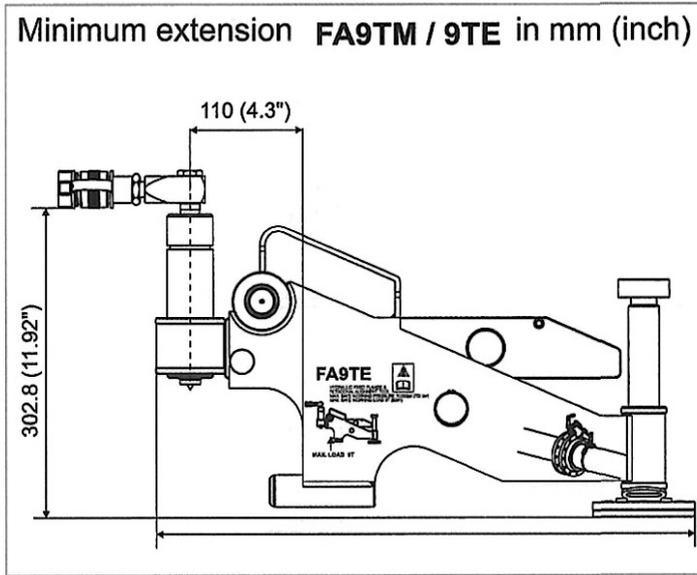


**APPLICATION RANGE:**

Two basic dimensions, A and B, will determine if the FA 4TM can be used to align the joint. If the flange joint to be aligned is between 30mm(1.18 inch) and 133mm(5.23 inch) as illustrate by (A), has a bolt hole size of 21mm(0.95 inch) or greater (B), then the FA4TM can be attached and alignment achieved . See chart as below: by flange type, class and diameter.

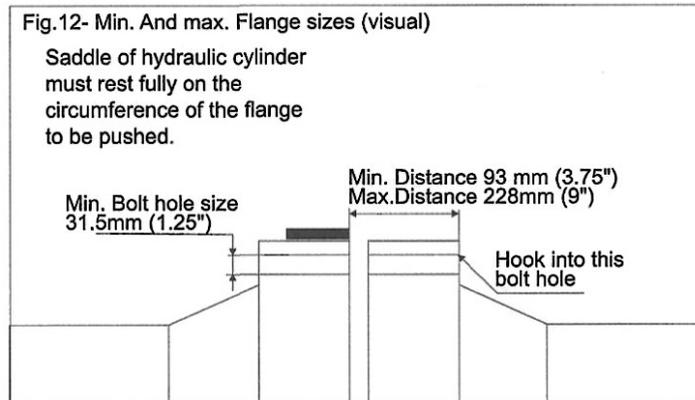


2. PRODUCT DESCRIPTION



APPLICATION RANGE:

Two basic dimensions, A and B, will determine if the FA9TM / 9TE can be used to align the joint. If the flange joint to be aligned is between 93mm(3.75 inch) and 228mm(9 inch) as illustrate by (A), has a bolt hole size of 35.5mm(1.40 inch) or greater (B), then the FA9TM / 9TE can be attached and alignment achieved . See chart as below: by flange type, class and diameter.



### 3. LIST OF EQUIPMENT

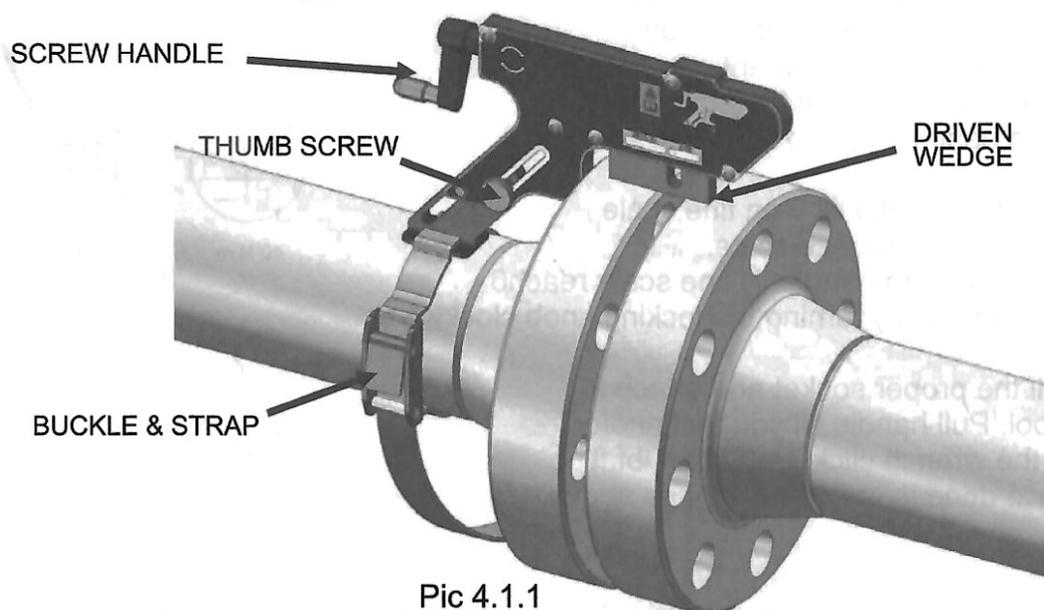
<b>FA1TM set includes:</b> 1* Carrying case 1* FA1TM Tool 1* Instruction Manual 1* Ratchet & Strap	<b>FA4TM set includes:</b> 1* Carrying case 1* FA4TM Tool 1* 20-110 N.m (2.04-11.22 kg.m) Torque Wrench with 22 mm Socket. 1* Instruction Manual 1* Ratchet & Strap	<b>FA9TE/9TM set includes:</b> 1* Carrying case 1* FA9TE Tool c/w 6T Hydraulic Cylinder 1* Instruction Manual
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### 4. INSTALLATION AND OPERATION

#### 4.1 HOW THE ALIGNMENT WORKS

##### 4.1.1 FA1TM (Pic 4.1.1)

1. The FSA-1TM is secured to the lower of the two flanges by fully inserting the lift hook into the bolt-hole at the point of greatest misalignment.
2. The drop leg thumb screw is slacked and the drop leg is adjusted down onto the pipe while the tool is held up level in the bolt hole.
3. The drop leg thumb screw is then tightened until firm .
4. The strap and ratchet are attached to the drop leg and around the pipe for added security.
5. The screw handle is then turned clockwise until the driven wedge comes into contact with the circumference of the opposite flange .



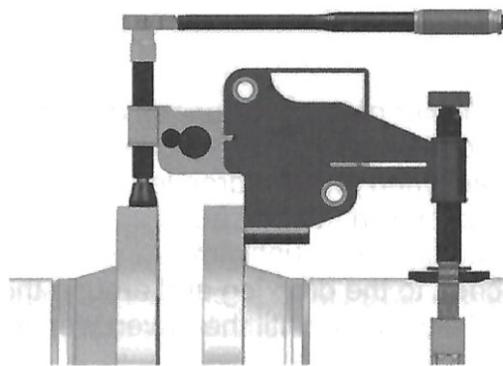
Pic 4.1.1

## 4. INSTALLATION AND OPERATION

### 4.1 HOW THE ALIGNMENT WORKS

#### 4.1.2 FA4TM (Pic 4.1.2)

1. The FA 4TM is secured to the lower of the two flanges by fully inserting the lift hook into the bolt-hole at the point of greatest misalignment.
2. The drop leg is adjusted down onto the pipe while the tool is held up level in the bolt hole.
3. The wing retaining screw loosened to allow the wing to be extended out .
4. The screw bolt is turned clockwise until the friction pad comes into contact with the circumference of the opposite flange .
5. The torque wrench is set to 50 lbf.ft (max), attached to the screw bolt and turned to screw down on the flange, bringing the joint into alignment.



Pic 4.1.2

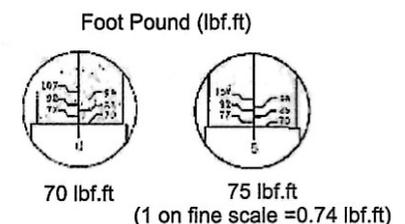
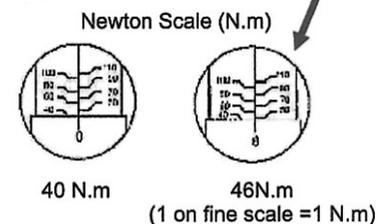


#### How to use the torque wrench

Balance the wrench in your left hand and unlock the knurled handle by turning the locking knob anti-clockwise. Set the torque amount by turning the knurled handle - see example 40-46 N.m.

1. Turn the handle till 0 on fine scale reach 40 N.m on base scale.
2. To set 46 turn handle till fine scale reach 6
3. Lock handle by turning the locking knob clockwise.

Install the proper socket and attach to the tool. Pull handle till you feel and/or hear the wrench click. Setting of lbf.ft scale is done in the same way as above.



Do not pull after the wrench clicks. Use special care at low torque settings. If the wrench has not been used for some time: operate it several times at low torque to allow internal lubricant to recoat. When not in use set to lowest torque setting. Don't turn handle below lowest torque setting . Your torque wrench is a precision measuring instrument and should be treated as such. Clean only by wiping, do not use any type of cleaner which may affect the special internal lubricant with which this wrench is packed at the factory.

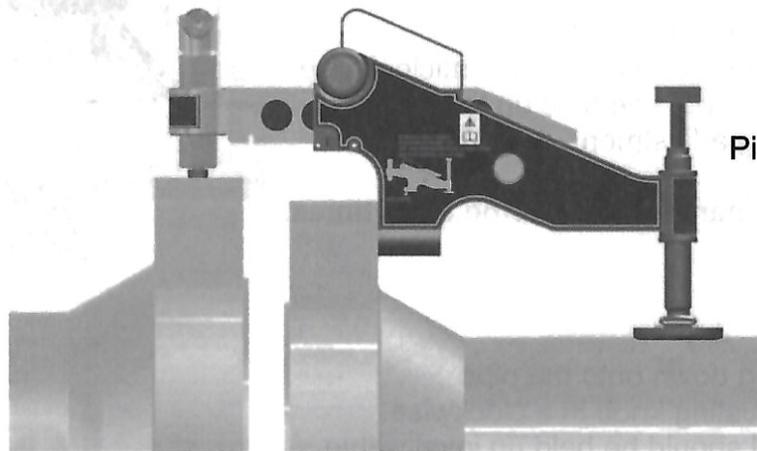
1. Do not attempt to turn the grip while it is locked
2. Do not turn the grip more than one turn below the lowest scale reading or above the highest scale reading.

#### 4. INSTALLATION AND OPERATION

##### 4.1 HOW THE ALIGNMENT WORKS FA1TM, FA4TM, FA9TM & FA9TE

###### 4.1.3 FA 9TM/9TE (Pic 4.1.3)

1. The FA9TE/9TM is secured to the lower of the two flanges by fully inserting the lift hook into the bolt-hole which is parallel with the bolt-hole at the point of greatest misalignment.
2. The drop leg is adjusted down onto the pipe while the tool is held up level in the bolt hole.
3. The release knob should be loosened to allow the wing to be extended out to the required distance.
4. The hydraulic cylinder should then be adjusted down onto the circumference of the flange opposite by rotating it in a clockwise direction.
5. The hydraulic hose and pump are attached to the cylinder and the hand pump is primed, bringing the joint into alignment.

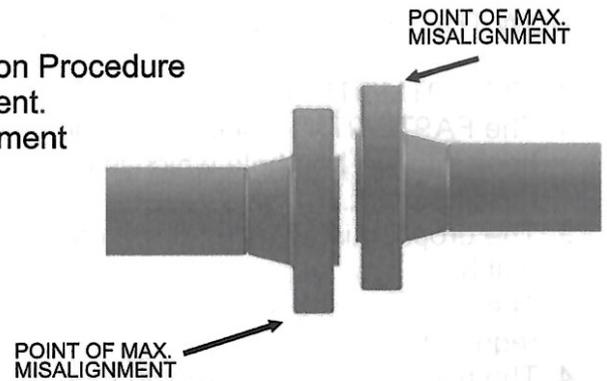


Pic 4.1.3

#### 4. INSTALLATION AND OPERATION

##### 4.2 INSTALLATION AND OPERATION

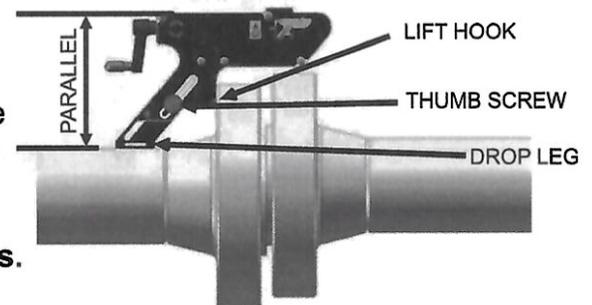
4.2.1 Carry out the Flange Misalignment Determination Procedure to determine the points of maximum misalignment. In this example the points of maximum misalignment are at the top and bottom of the joint.



4.2.2 Guide the lift hook into the bolt-hole at the maximum point of misalignment.

###### FA1TM

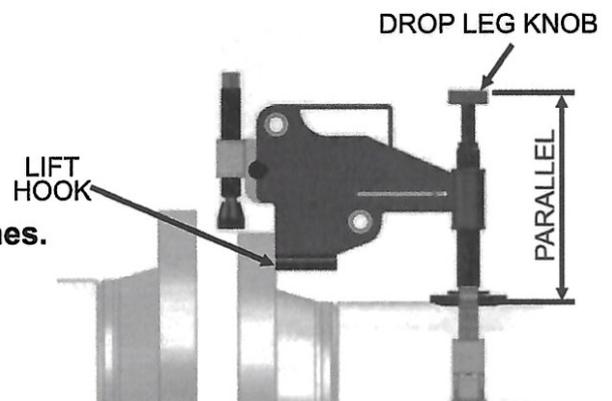
Adjust the drop leg down onto the pipe by slackening the thumb screw in an anticlockwise direction. The tool should be held up level within the bolt-hole during adjustment.



**The tool must be parallel to the pipe at all times.**

###### FA4TM

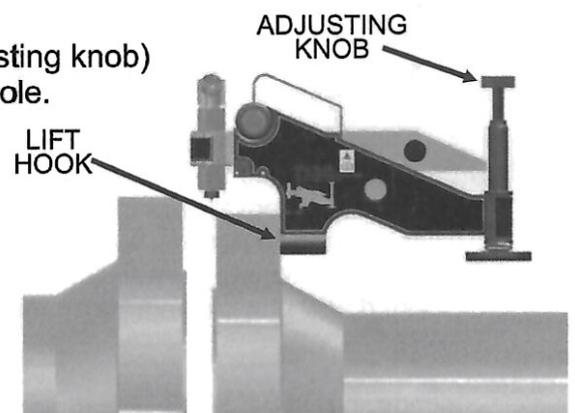
Adjust the drop leg down onto the pipe by turning the adjusting knob in a clockwise direction. The tool should be held up level within the bolt-hole during adjustment.



**The tool must be parallel to the pipe at all times.**

###### FA9TM/ 9TE

Adjust the drop leg onto the pipe (using the adjusting knob) while holding the lift hook up level with the bolt-hole.

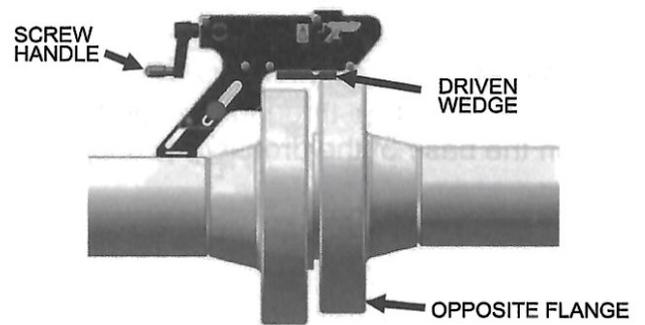


#### 4. INSTALLATION AND OPERATION

##### 4.2.3

###### FA1TM

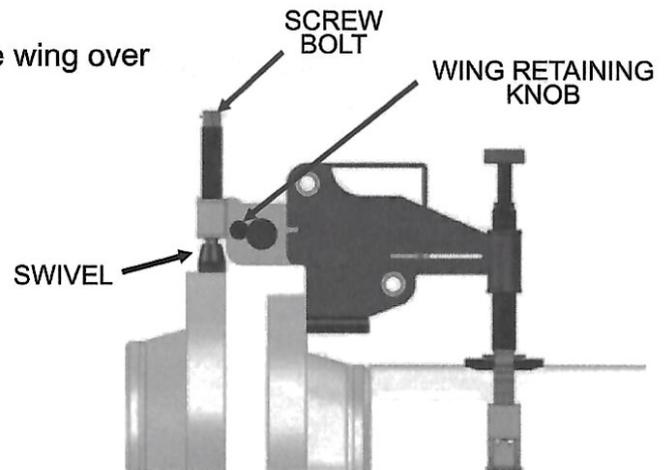
Rotate the screw handle clockwise until the driven wedge makes contact with the opposite flange.



###### FA4TM

Loosen the wing retaining knob and extend the wing over to the opposite flange.

Rotate the screw bolt onto the surface of the opposite flange. Ensure that the tool is sitting level and that the friction pad on the base of the swivel is in full and even contact with the surface of the opposite flange.



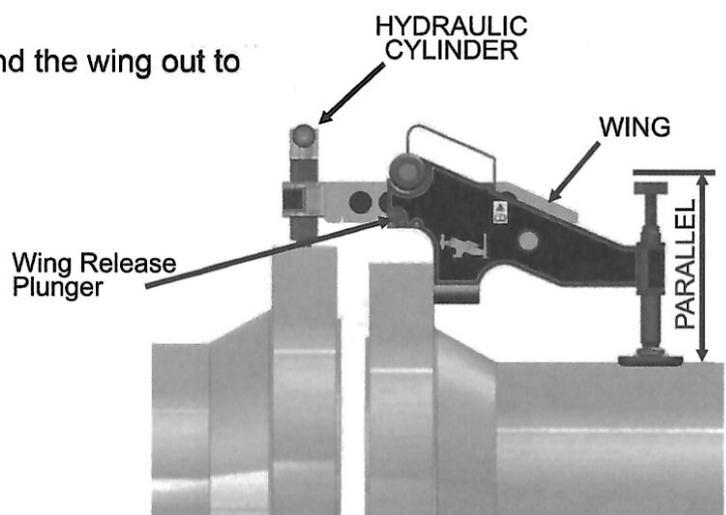
###### FA9TM/9TE

Loosen the wing release knob and extend the wing out to the required distance.

Rotate the hydraulic cylinder down until the base of the cylinder located onto the surface of the opposite flange.

Ensure that the tool is sitting level and that the cylinder is in full and even contact with the surface of the opposite flange.

**Ensure tool is parallel to pipe.**

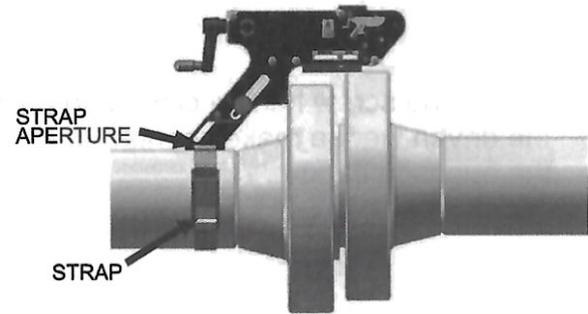


4. INSTALLATION AND OPERATION

4.2.4

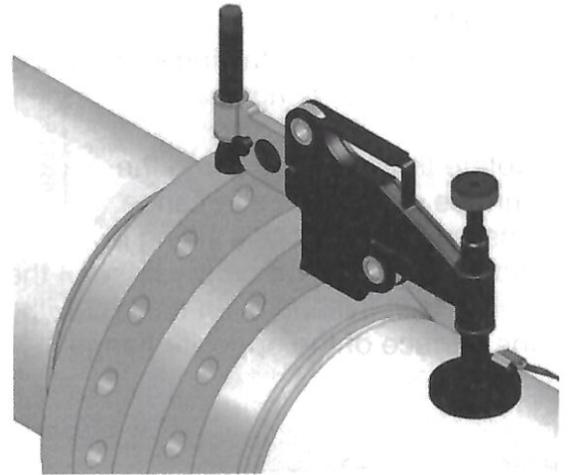
FA1TM

Thread the strap through the aperture on the base of the drop leg as shown.



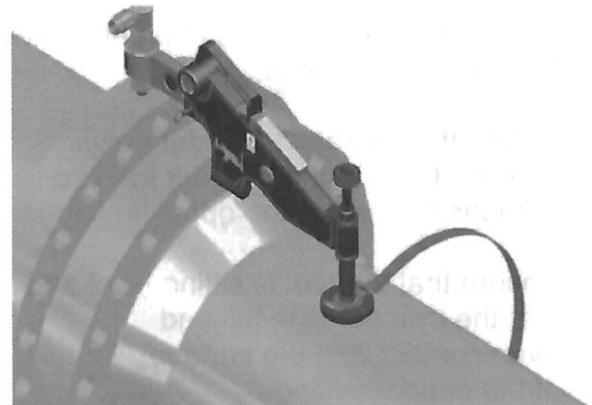
FA4TM

Attach the hook of the strap through the buckle on top of the base plate as shown.



FA9TM/ 9TE

Attach the hook on the strap through the base plate as shown.

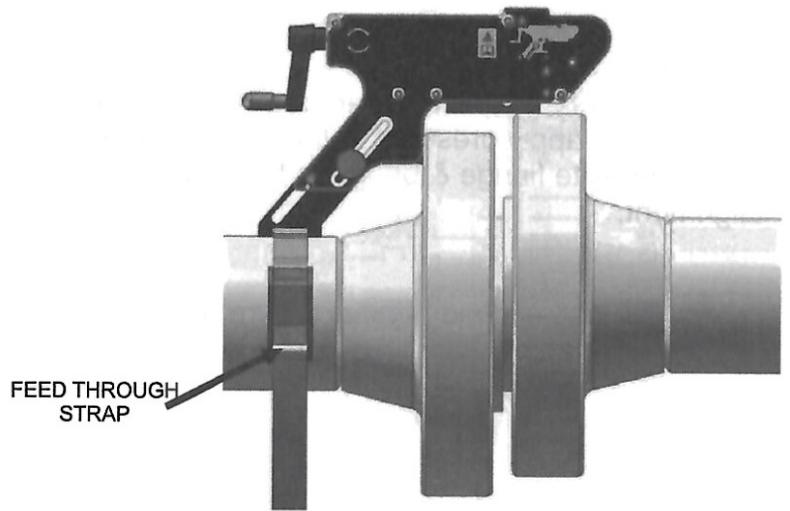


#### 4. INSTALLATION AND OPERATION

##### 4.2.5

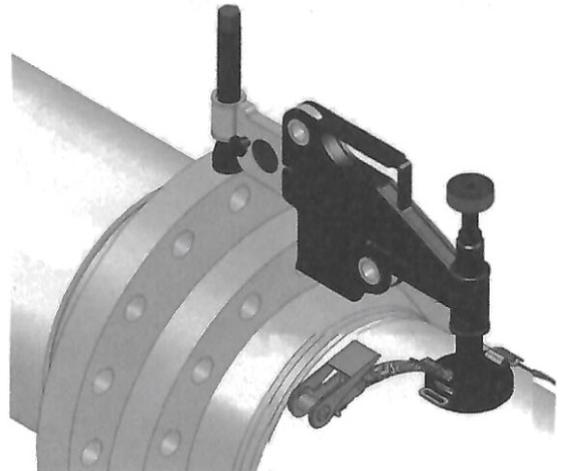
##### FA1TM

Feed the open end of the strap through the buckle mechanism as shown. Close the clasp to secure strap.



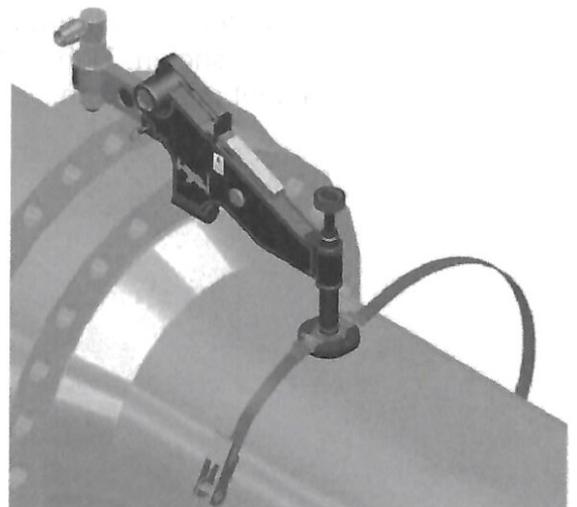
##### FA4TM

Now place the hook of the ratchet mechanism through the opposite side of the buckle as show.



##### FA9TM/ 9TE

Now place the hook of the ratchet mechanism through the base on the opposite side as show.



#### 4. INSTALLATION AND OPERATION

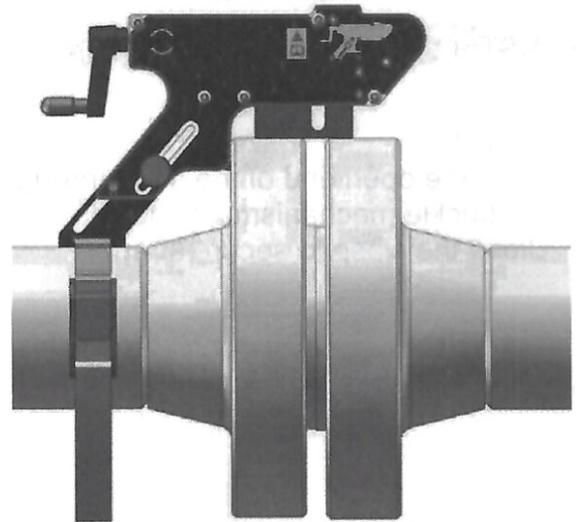
##### 4.2.6

##### FA1TM

Now that everything is secured, rotate the handle clockwise to apply pressure to the circumference of the opposite flange & bring the flange joint in alignment.

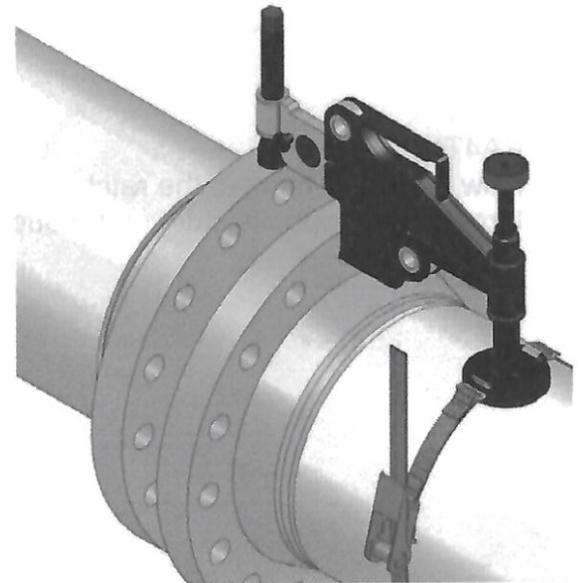


Don't exceed hand pressure on the screw handle.



##### FA4TM

Feed the open end of the strap through the ratchet mechanism as shown. Tighten the strap using the ratchet mechanism.



##### FA9TM/ 9TE

Feed the open end of the strap through the ratchet mechanism as shown. Tighten the strap using the ratchet mechanism.

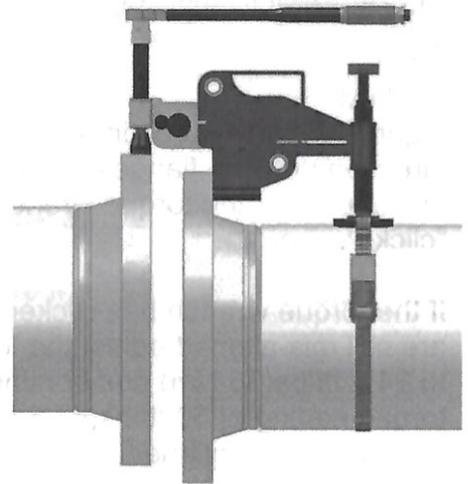


#### 4. INSTALLATION AND OPERATION

##### 4.2.7

##### FA4TM

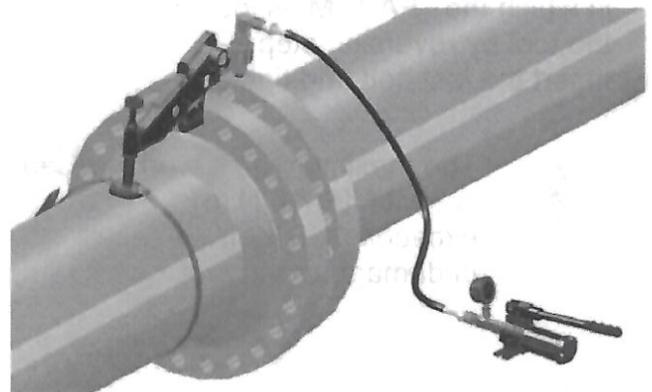
The torque wrench should be set at 14 lbf.ft (19N.m) then attached to the screw bolt.



##### FA9TM/9TE

Connect the hydraulic pump to the hydraulic hose, and the hose to the hydraulic adjusting cylinder.

Prime the pump until the joint comes into alignment.



#### 4. INSTALLATION AND OPERATION

##### 4.2.8

##### FA4TM

Tighten the screw bolt in a clockwise direction until the flanges come into alignment ; or the torque wrench "clicks".

If the torque wrench has clicked and the flanges are still mis-aligned adjust the torque wrench up to 24.2 ft/lbs(33 Nm) and continue until a maximum torque setting of 50 ft/lbs(67.8 Nm) is reached or the flanges are aligned.

Once in alignment the bolts may be inserted and tightened.

After replacing all of the bolts ( apart from the bolt which will go into the bolt-hole in which the **FA4TM** is located), remove the tool by reversing step 2-8. Insert the last bolt and tighten.



The maximum safe working load is 50 lbf.ft(67.8 N.m) exceeding 50 lbf.ft will result in damage to the tool.

##### FA9TM /9TE

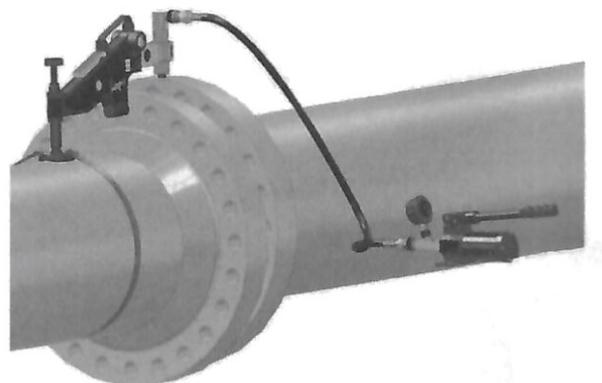
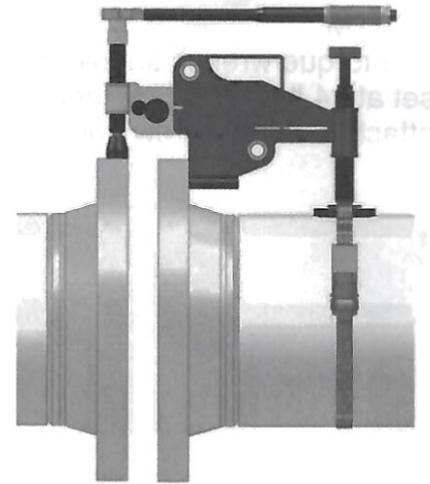
Once in alignment the bolts may be inserted and tightened.

After replacing all of the bolts, remove the tool by reversing steps 2 - 4.

Insert the last bolt and tighten.



Care should be taken not to drop any of the component parts when removing them from the flange joint. This action will prevent injuries to either the operator's lower limbs, or to passers-by.

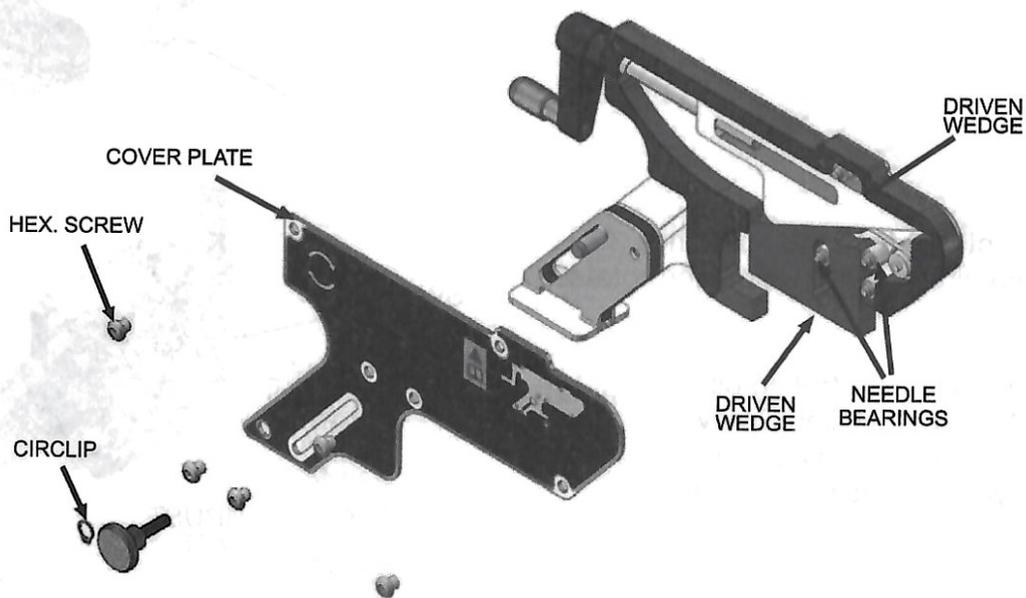


## 5. EXAMINATION, MAINTENANCE AND STORAGE

- \* On return from each job and before allocation against subsequent work the completeness of the **SUPPLY Flange Alignment Tool** kit must be established and items examined to ensure that they are serviceable.
- \* Any missing or damaged items are to be replaced as soon as possible and prior to the tool being used again.
- \* Store the hydraulic flange alignment in a cool, dry place and ensure all machined surfaces are greased.
- \* Ensure wedges, pins and legs remain grit free and that parts move freely.
- \* Grease all moving parts regularly.

### FSA-1TM

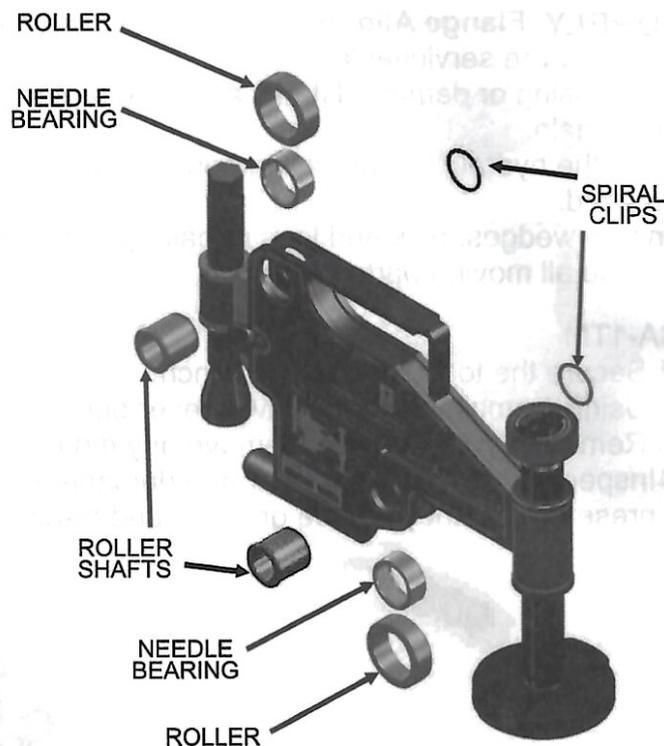
- 5.1 Secure the tool upright on a bench.
- 5.2 Using a small flat screw driver, lever out one circlip and unscrew 5 x 4mm hex screws.
- 5.3 Remove cover plate and remove any dirt or corrosion from moving parts.
- 5.4 Inspect components for wear and damage, replace if necessary! If there is no damage present, then they can be greased and re-assembled by reversing step 1-4.



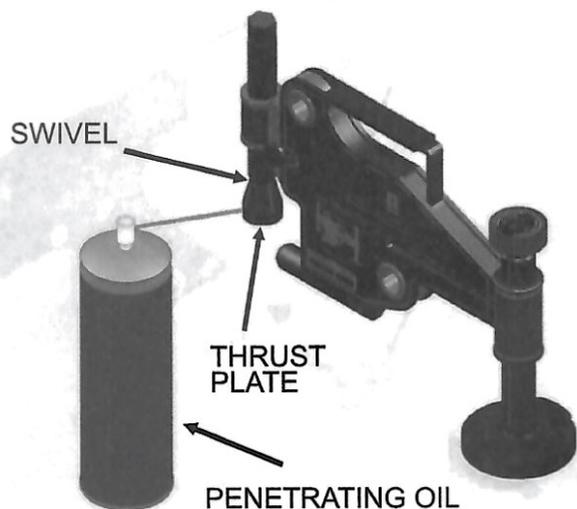
5. EXAMINATION, MAINTENANCE AND STORAGE

FA4TM

- 5.1 Secure the tool upright on a bench.
- 5.2 Using a small flat screw driver, lever out the end of the spiral clips and then rotate anti-clockwise and remove.
- 5.3 Slide the roller shafts out in order to remove the rollers and bearings for examination.
- 5.4 Inspect the roller shafts, rollers and bearings for damage. If there is no damage present then they can be cleaned, greased and re-assembled by reversing steps 1-4.



- 5.5 It is important that the thrust bearing is free from dirt and corrosion and rotates freely.
- 5.6 With the use of a penetrating oil such as WD 40 or similar. Spray the oil between the thrust plate and the swivel as shown opposite.



- 5.7 Ensure the thrust plate rotates freely before using the tool to align a flange joint.



## 6. FLANGE MISALIGNMENT DETERMINATION PROCEDURE

The tool being used must not be attached to a flanged joint prior to the misalignment procedure being carried out.

### 6.1 LATERAL MISALIGNMENT

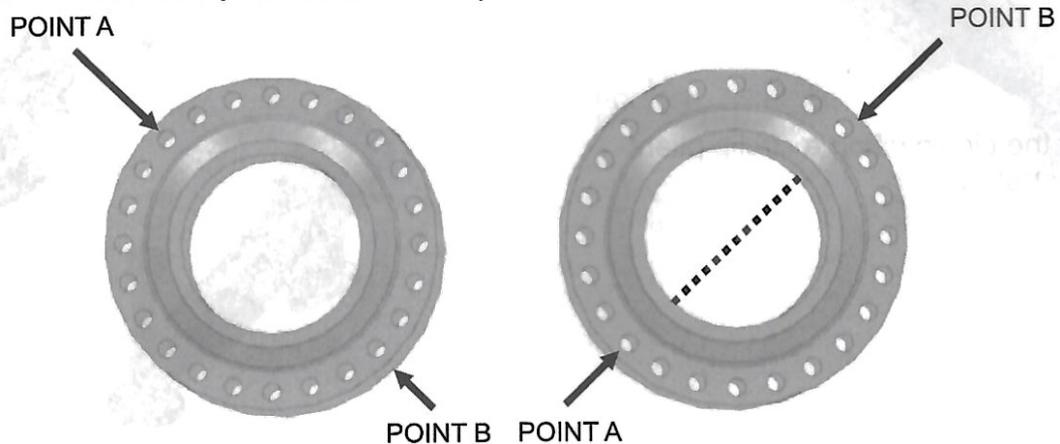
#### 6.1.1

Loosen and remove every second bolt around the flange, continue with this until misalignment occurs.

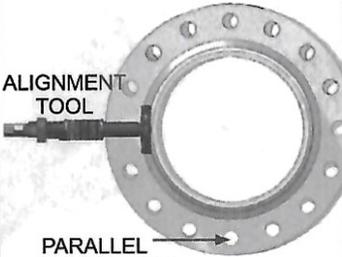
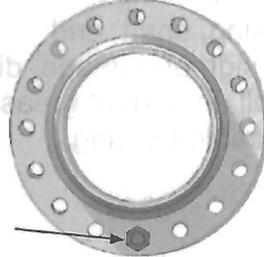
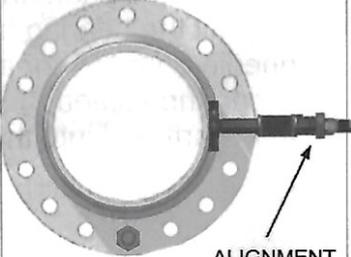
A flanged joint, once broken down, may spring out of alignment at any point, or in any direction around its circumference. Misalignment may not occur until only a few bolts remain.

#### 6.1.2

At this point the direction of any misalignment should become obvious. The alignment tool being used should be attached at the maximum point of misalignment (point A or B in the examples shown below.)



### 6.2 ROTATIONAL (TWIST) MISALIGNMENT

	 <p>ALIGNMENT TOOL</p> <p>PARALLEL BOLT-HOLES</p>		 <p>ALIGNMENT TOOL</p>
<p>If the outer circumference of the flanges are in alignment but the operator is unable to fit the bolt into any two corresponding bolt-holes then rotational misalignment may have occurred. In this case the alignment tool can be attached to the most accessible point as misalignment occurs at all bolt-holes to the same degree.</p>	<p>Attach the alignment tool at the most accessible/ convenient point ( as shown in sections ) and use it to push the flanges out of alignment until one pair of bolt-holes becomes parallel.</p>	<p>Insert the bolt into the aligned bolt-hole and release the alignment tool. The load will transfer onto the bolt.</p>	<p>Repeat steps 1 and 2 at other points around the flange until all of the remaining bolt-holes are parallel and the rest of the bolts can be inserted.</p>

**7. TROUBLE SHOOTING**

Problem	Cause	Solution
The tool is attached and appears to be functioning properly, but the joint will not align.	<p>A. There may be something restricting the joint from alignment.</p> <p>B. The joint may require more than 1.0 tons (10kN) force to align.</p>	<p>A. Check the area around the joint to establish if there is an obstruction to the joint.</p> <p>B. If the joint requires more force than that of the 1.0T ( 10kN )tool, attach a second too or another method of aligning should be adopted.</p>
The thrust plate is sliding along the circumference of the opposite flange as the tool is aligning the joint.	<p>Grit or Dirt on wing, rollers or bearing.</p> <p>Wing is at full extension.</p>	<p>Ensure the rollers are rotating freely and that there is no restrictions to the rollers on the wing surfaces such as grit or dirt.</p> <p>Ensure the wing has sufficient travel left in order to allow the joint to align.</p>
The tool is attached and appears to be functioning properly, but the joint will not align.	<p>A. There may be something restricting the joint from alignment.</p> <p>B. The joint may require more than 4.0 tons (40kN) force to align.</p>	<p>A. Check the area around the joint to establish if there is an obstruction to the joint.</p> <p>B. If the joint requires more force than that of the 4.0T ( 40kN )tool, then another method of aligning should be adopted.</p>
The thrust plate is twisting on the circumference of the flange when the screw bolt is tightened.	<p>A. There may be Grit or Dirt within the swivel / thrust plate.</p>	<p>A. Check the thrust plate rotates freely. If the thrust plate is not rotating then spray penetrating liquid into the gap between the swivel and thrust plate in order to loosen it.</p>

**7. TROUBLE SHOOTING**

Problem	Cause	Solution
<p>The tool is advancing but does not reach full pressure.</p>	<p>Air could be present in the hydraulic system.</p>	<p>A. Connect the hand pump to the tool with the hydraulic hose.                      B. Close the release valve on the pump, and prime the pump until the hydraulic cylinder is fully extended and a small pressure is achieved.                      C. With the hand pump held above the tool and in an upright position, open the release valve causing any air that is within the system to be forced up through the pump and vented into the oil working pressure.                      D. Repeat steps 1-3 three or four times to ensure that all air is removed from the system and the tool will reach full working pressure.</p>
<p>The friction pad is sliding on the circumference of the opposite flange as the FA9TE/9TM is aligning the joint.</p>	<p>Grit or dirt on wing, rollers or bearings, wing is at full extension.</p>	<p>A. Ensure the rollers are rotating freely and that there is no restriction to the rollers on the wing surfaces such as dirt or grit.                      B. Check that the wing is not at full extension when aligning the joint.                      C. Ensure that there is enough extension left to allow the FA9TE/9TM to expand as the joint is aligned.</p>
<p>FA9TE/9TM is attached and appears to be functioning properly, but the joint will not align.</p>	<p>A. There may be air in the hydraulic system restricting the force on the flanges.                      B. There may be something restricting the joint at a point close to the flanges. The joint may require more than 9.0 tons (90kN) pressure to align.</p>	<p>A. Check the area around the joint to establish if there is an obstruction to the joint.                      B. If the joint requires more force than that of the 9.0 tons (90kN) of the tool then another method to align the joint should be adopted.</p>

Instructions for:  
Hydraulic Flange Alignment Tool

Models:  
FA1TM, FA4TM, FA9TM, FA9TE & FA9TE

**8. RANGE OF APPLICATION**

**10.1 Bs10 FLANGE RANGE OF APPLICATION**

CLASS A	NPS	3 1/2"	4"	5"	6"	7"	8"	9"	10"	12"	13"	14"	15"	16"	17"	18"	19"	20"	21"	22"	23"	24"	26"	27"	29"	30"	33"	35"	36"	39"	42"	45"	48"	54"	60"	66"	72"					
	TOOL	FA1TM																																								
CLASS D	NPS	4"	5"	6"	7"	8"	9"	10"	12"	13"	14"	15"	16"	17"	18"	19"	20"	21"	22"	23"	24"	29"	30"	33"	35"	36"	39"	42"	45"	48"	54"	60"	66"	72"	78"	84"	96"	108"	120"			
CLASS E	TOOL	FA1TM																																								
CLASS F	NPS	1 1/4"	1 1/2"	2"	2 1/2"	3"	3 1/2"	4"	5"	6"	7"	8"	9"	10"	12"	13"	14"	15"	16"	17"	18"	19"	20"	21"	22"	23"	24"	27"	29"	30"	33"	35"	36"	39"	42"	45"	48"					
CLASS G	TOOL	FA1TM																																								
CLASS H	NPS	1 1/4"	1 1/2"	2"	2 1/2"	3"	3 1/2"	4"	5"	6"	7"	8"	9"	10"	12"	13"	14"	15"	16"	17"	18"	19"	20"	21"	22"	23"	24"	27"	29"	30"	33"	35"	36"	39"	42"	45"	48"					
CLASS I	TOOL	FA1TM																																								
CLASS J	NPS	1 1/4"	1 1/2"	2"	2 1/2"	3"	3 1/2"	4"	5"	6"	7"	8"	9"	10"	12"	13"	14"	15"	16"	17"	18"	19"	20"	21"	22"	23"	24"	27"	29"	30"	33"	35"	36"	39"	42"	45"	48"					
CLASS K	TOOL	FA1TM																																								
CLASS L	NPS	1"	1 1/4"	1 1/2"	2"	2 1/2"	3"	3 1/2"	4"	5"	6"	7"	8"	9"	10"	12"	13"	14"	15"	16"	17"	18"	19"	20"	21"	22"	23"	24"	27"	29"	30"	33"	35"	36"	39"	42"	45"	48"				
CLASS M	TOOL	FA1TM																																								
CLASS N	NPS	1"	1 1/4"	1 1/2"	2"	2 1/2"	3"	3 1/2"	4"	5"	6"	7"	8"	9"	10"	12"	13"	14"	15"	16"	17"	18"	19"	20"	21"	22"	23"	24"	27"	29"	30"	33"	35"	36"	39"	42"	45"	48"				
CLASS O	TOOL	FA1TM																																								
CLASS P	NPS	1/2"	3/4"	1"	1 1/4"	1 1/2"	2"	2 1/2"	3"	3 1/2"	4"	4 1/2"	5"	6"	7"	8"	9"	10"	12"	13"	14"	15"	16"	17"	18"	19"	20"	21"	22"	23"	24"	27"	29"	30"	33"	35"	36"	39"	42"	45"	48"	
CLASS Q	TOOL	FA1TM																																								
CLASS R	NPS	1/2"	3/4"	1"	1 1/4"	1 1/2"	2"	2 1/2"	3"	3 1/2"	4"	4 1/2"	5"	6"	7"	8"	9"	10"	11"	12"	13"	14"	15"	16"	17"	18"	19"	20"	21"	22"	23"	24"	27"	29"	30"	33"	35"	36"	39"	42"	45"	48"
CLASS S	TOOL	FA1TM																																								
CLASS T	NPS	1/2"	3/4"	1"	1 1/4"	1 1/2"	2"	2 1/2"	3"	3 1/2"	4"	4 1/2"	5"	6"	7"	8"	9"	10"	11"	12"	13"	14"	15"	16"	17"	18"	19"	20"	21"	22"	23"	24"	27"	29"	30"	33"	35"	36"	39"	42"	45"	48"
CLASS U	TOOL	FA1TM																																								

	SUITABLE FOR FA1TM TOOL
	SUITABLE FOR FA4TM TOOL
	SUITABLE FOR FA9TM/9TE TOOL
	NOT SUITABLE FOR TOOLS

Instructions for:  
Hydraulic Flange Alignment Tool

Models:  
FA1TM, FA4TM, FA9TM & FA9TE

**8. RANGE OF APPLICATION**

**API6BX WELD NECK FLANGE RANGE OF APPLICATION**

CLASS 10K	NPS	1 13-16"	2 9-16"	3 1-8"	4 1-16"	5 1-8"	7 1-16"	9"	11"	13 5-8"	16 3-4"	
	TOOL	FA1TM		FA4TM		FA9TE/9TM						
CLASS 15K	NPS	1 13-16"	2 1-16"	2 9-16"	3 1-8"	4 1-16"	5 1-8"	7 1-16"	9"	11"	13 5-8"	16 3-4"
	TOOL	FA1TM		FA4TM		FA9TE/9TM						
CLASS 20K	NPS	1 13-16"	2 1-16"	2 9-16"	3 1-8"	4 1-16"	5 1-8"	7 1-16"	9"	11"	13 5-8"	16 3-4"
	TOOL	FA4TM		FA9TE/9TM								

**API6B WELD NECK FLANGE RANGE OF APPLICATION**

CLASS 2K	NPS	2 1-16"	2 9-16"	3 1-8"	4 1-16"	5 1-8"	7 1-16"	9"	11"	13 5-8"	16 3-4"	21 1-4"
	TOOL	FA1TM		FA4TM								
CLASS 3K	NPS	2 1-16"	2 9-16"	3 1-8"	4 1-16"	5 1-8"	7 1-16"	9"	11"	13 5-8"	16 3-4"	21 1-4"
	TOOL	FA1TM		FA4TM		FA9TE/9TM						
CLASS 5K	NPS	2 1-16"	2 9-16"	3 1-8"	4 1-16"	5 1-8"	7 1-16"	9"	11"	13 5-8"	16 3-4"	21 1-4"
	TOOL	FA1TM		FA4TM		FA9TE/9TM						

	SUITABLE FOR FA1TM TOOL
	SUITABLE FOR FA4TM TOOL
	SUITABLE FOR FA9TM/9TE TOOL
	NOT SUITABLE FOR TOOLS

Instructions for:  
Hydraulic Flange Alignment Tool

Models:  
FA1TM, FA4TM, FA9TM & FA9TE

8. RANGE OF APPLICATION

10.2 ASME B16.5 FLANGE RANGE OF APPLICATION

CLASS 2500	NPS	3/4"	1"	1 1/4"	1 1/2"	2"	2 1/2"	3"	3 1/2"	4"	5"	6"	8"	10"	12"	14"	16"	18"	20"	24"	
	TOOL	FA1TM																			
CLASS 1500	NPS	3/4"	1"	1 1/4"	1 1/2"	2"	2 1/2"	3"	3 1/2"	4"	5"	6"	8"	10"	12"	14"	16"	18"	20"	24"	
	TOOL	FA1TM																			
CLASS 900	NPS	3/4"	1"	1 1/4"	1 1/2"	2"	2 1/2"	3"	3 1/2"	4"	5"	6"	8"	10"	12"	14"	16"	18"	20"	24"	
	TOOL	FA1TM																			
CLASS 400	NPS	3/4"	1"	1 1/4"	1 1/2"	2"	2 1/2"	3"	3 1/2"	4"	5"	6"	8"	10"	12"	14"	16"	18"	20"	24"	
	TOOL	FA1TM																			
CLASS 300	NPS	3/4"	1"	1 1/4"	1 1/2"	2"	2 1/2"	3"	3 1/2"	4"	5"	6"	8"	10"	12"	14"	16"	18"	20"	24"	
	TOOL	FA1TM																			
CLASS 150	NPS	1/2"	3/4"	1"	1 1/4"	1 1/2"	2"	2 1/2"	3"	3 1/2"	4"	5"	6"	8"	10"	12"	14"	16"	18"	20"	24"
	TOOL	FA1TM																			
CLASS 50	NPS	3/4"	1"	1 1/4"	1 1/2"	2"	2 1/2"	3"	3 1/2"	4"	5"	6"	8"	10"	12"	14"	16"	18"	20"	24"	
	TOOL	FA1TM																			

SUITABLE FOR FA1TM TOOL
SUITABLE FOR FA4TM TOOL
SUITABLE FOR FA9TM/9TE TOOL
NOT SUITABLE FOR TOOLS

Instructions for:  
Hydraulic Flange Alignment Tool

Models:  
FA1TM, FA4TM, FA9TM & FA9TE

8. RANGE OF APPLICATION

ASME B16.47 FLANGE RANGE OF APPLICATION

CLASS CL150S	22"	26"	28"	30"	32"	34"	36"	38"	40"	42"	44"	46"	48"
TOOL	FA9TE/9TM												
CLASS CL300S	22"	26"	28"	30"	32"	34"	36"	38"	40"	42"	44"	46"	48"
TOOL	FA9TE/9TM												
CLASS CL400S	22"	26"	28"	30"	32"	34"	36"	38"	40"	42"	44"	46"	48"
TOOL	FA9TE/9TM												
CLASS CL600S	22"	26"	28"	30"	32"	34"	36"	38"	40"	42"	44"	46"	48"
TOOL	FA9TE/9TM												
CLASS CL900S	22"	26"	28"	30"	32"	34"	36"	38"	40"	42"	44"	46"	48"
TOOL	FA9TE/9TM												

DIN WELD NECK FLANGE RANGE OF APPLICATION

CLASS CL150S	1 1/2"	2"	2 1/2"	3"	4"	5"	6"	7"	8"	10"	12"	14"	16"	18"	20"	24"	28"	32"	36"	40"	48"	56"	72"	80"	
TOOL	FA1TM																								
CLASS CL250S	1/2"	3/4"	1"	1 1/4"	1 1/2"	2"	2 1/2"	3"	4"	5"	6"	7"	8"	10"	12"	14"	16"	18"	20"	24"	28"	32"	36"	40"	
TOOL	FA1TM																								
CLASS CL400S	1/2"	2"	2 1/2"	3"	4"	5"	6"	7"	8"	10"	12"	14"	16"	18"	20"	24"	28"	32"	36"	40"	48"	56"	72"	80"	
TOOL	FA1TM																								
CLASS CL600S	3/4"	1"	1 1/2"	2"	2 1/2"	3"	4"	5"	6"	7"	8"	10"	12"	14"	16"	18"	20"	24"	28"	32"	36"	40"	48"	56"	72"
TOOL	FA1TM																								
CLASS CL1000S	1/2"	3/4"	1"	1 1/2"	2"	2 1/2"	3"	4"	5"	6"	7"	8"	10"	12"	14"	16"	18"	20"	24"	28"	32"	36"	40"	48"	56"
TOOL	FA1TM																								
CLASS CL1500S	3/8"	1/2"	3/4"	1"	1 1/2"	2"	2 1/2"	3"	4"	5"	6"	7"	8"	10"	12"	14"	16"	18"	20"	24"	28"	32"	36"	40"	48"
TOOL	FA1TM																								

SUITABLE FOR FA1TM TOOL
SUITABLE FOR FA4TM TOOL
SUITABLE FOR FA9TM/9TE TOOL
NOT SUITABLE FOR TOOLS

8. RANGE OF APPLICATION

10.3 SPO FLANGE RANGE OF APPLICATION

CLASS 1500	NPS	2 1/2"	3"	3 1/2"	4"	5"	6"	8"	10"	12"	14"	16"	18"	20"	22"	24"	26"	28"	30"	32"	34"	36"	38"	40"	42"	44"	46"	48"
	TOOL	FA1TM												FA4TM														
CLASS 300	NPS	2 1/2"	3"	3 1/2"	4"	5"	6"	8"	10"	12"	14"	16"	18"	20"	22"	24"	26"	28"	30"	32"	34"	36"	38"	40"	42"	44"	46"	48"
	TOOL	FA1TM												FA9TE/9TM														
CLASS 600	NPS	2 1/2"	3"	3 1/2"	4"	5"	6"	8"	10"	12"	14"	16"	18"	20"	22"	24"	26"	28"	30"	32"	34"	36"	38"	40"	42"	44"	46"	48"
	TOOL	FA4TM												FA9TE/9TM														
CLASS 900	NPS	2 1/2"	3"	3 1/2"	4"	5"	6"	8"	10"	12"	14"	16"	18"	20"	22"	24"	26"	28"	30"	32"	34"	36"	38"	40"	42"	44"	46"	48"
	TOOL	FA4TM												FA9TE/9TM														
CLASS 1500	NPS	2 1/2"	3"	3 1/2"	4"	5"	6"	8"	10"	12"	14"	16"	18"	20"	22"	24"	26"	28"	30"	32"	34"	36"	38"	40"	42"	44"	46"	48"
	TOOL	FA4TM												FA9TE/9TM														
CLASS 2500	NPS	2 1/2"	3"	3 1/2"	4"	5"	6"	8"	10"	12"	14"	16"	18"	20"	22"	24"												
	TOOL	FA4TM												FA9TE/9TM														
CLASS 5000	NPS	2 1/2"	3"	3 1/2"	4"	5"	6"	8"	10"	12"	14"	16"	18"	20"	22"	24"												
	TOOL	FA4TM												FA9TE/9TM														
CLASS 7500	NPS	2 1/2"	3"	3 1/2"	4"	5"	6"	8"	10"	12"	14"	16"	18"	20"	22"	24"												
	TOOL	FA4TM												FA9TE/9TM														
CLASS 10000	NPS	2 1/2"	3"	3 1/2"	4"	5"	6"	8"	10"	12"	14"	16"	18"	20"	22"	24"												
	TOOL	FA4TM												FA9TE/9TM														
CLASS 15000	NPS	2 1/2"	3"	3 1/2"	4"	5"	6"	8"	10"	12"	14"	16"	18"	20"	22"	24"												
	TOOL	FA4TM												FA9TE/9TM														

SUITABLE FOR FA1TM TOOL
SUITABLE FOR FA4TM TOOL
SUITABLE FOR FA9TM/9TE TOOL
NOT SUITABLE FOR TOOLS