



Operation and Maintenance Manual

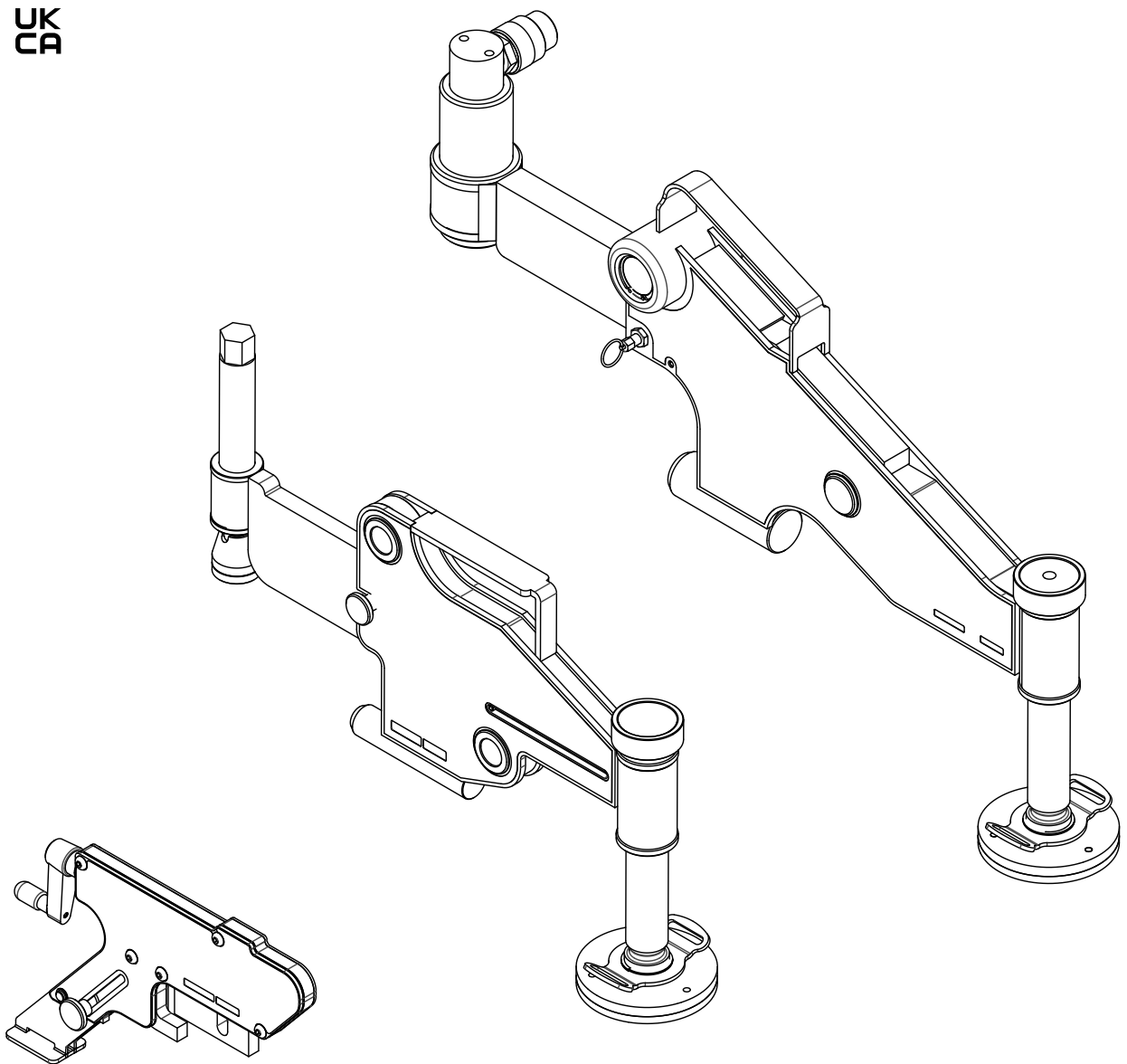
Enerpac FA1TMSTD (ATM2), FA4TMSTD (ATM4), FA9TESTD (ATM9) Flange Alignment Tools

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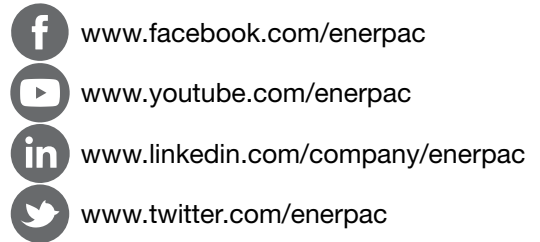
Document Language: ENGLISH EN



To reduce the risk of injury, users must read and understand this document before use.

ABOUT US

Enerpac is a global market leader in high pressure hydraulic tools, controlled force products, portable machining, on-site services and solutions for precise positioning of heavy loads. As a leading innovator with a 110-year legacy, Enerpac has helped move and maintain some of the largest structures on earth. When safety and precision matters, elite professionals in industries such as aerospace, infrastructure, manufacturing, mining, oil & gas and power generation rely on Enerpac for quality tools, services and solutions. For additional information, visit www.enerpac.com.

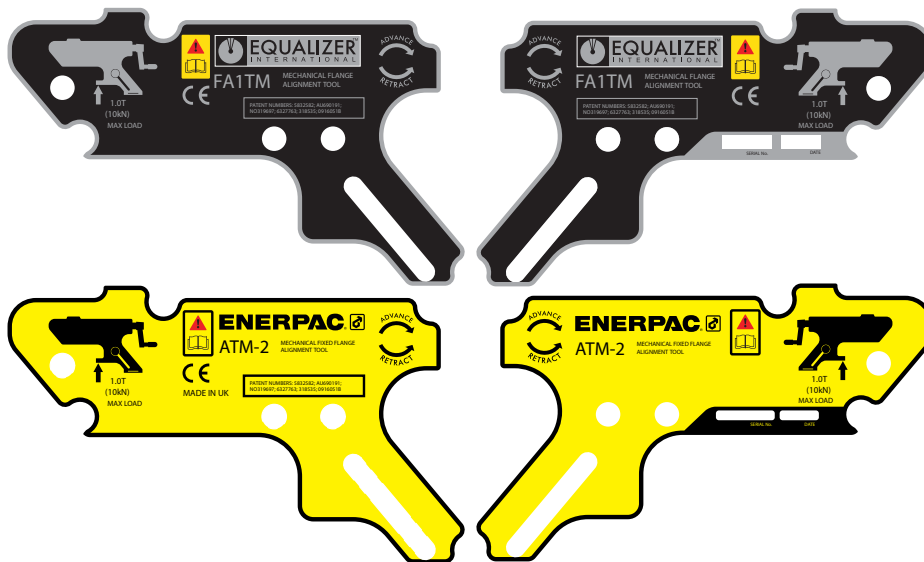


WARRANTY

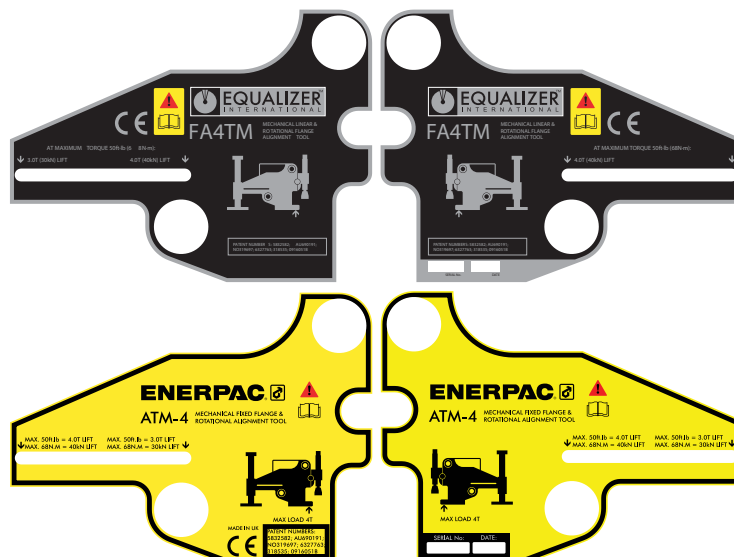
Refer to the Enerpac Global Warranty document for terms and conditions of the product warranty. Such warranty information can be found at www.enerpac.com.

NAMEPLATE

FA1TMSTD (ATM2)



FA4TMSTD (ATM4)



FA9TESTD (ATM9)



AVAILABLE LANGUAGES

L4769 is available in the following languages, visit www.enerpac.com for a copy.

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- 如需其他语言, 请前往 www.enerpac.com.

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1. Safety

Read all instructions carefully. Follow all recommended safety precautions to avoid personal injury as well as damage to the product and / or damage to other property. Equalizer cannot be responsible for any damage or injury from unsafe use, lack of maintenance, or incorrect operation. Do not remove warning labels, tags, or decals. In the event that any questions or concerns arise, contact Equalizer or a local Equalizer distributor for clarification.

Save these instructions for future use.

If you have never been trained on high-pressure hydraulic safety, consult your distributor or service center for information about Equalizer Hydraulic Safety Courses.

This manual follows a system of safety alert symbols, signals, words, and safety messages to warn the user of specific hazards. Failure to comply with these warnings could result in death or serious personal injury, as well as damage to the equipment or other property.



The Safety Alert Symbol appears throughout this manual. It is used to alert you to potential physical injury hazards. Pay close attention to Safety Alert Symbols and obey all safety messages that follow this symbol to avoid the possibility of death or serious injury.

Safety Alert Symbols are used in conjunction with certain Signal Words that call attention to safety messages or property damage messages and designate a degree or level of hazard seriousness. The Signal Words used in this manual are DANGER, WARNING, CAUTION, and NOTICE.

⚠ DANGER Indicates a hazardous situation that, if not avoided, will result in death or serious personal injury.

⚠ WARNING Indicates a hazardous situation that, if not avoided, could result in death or serious personal injury.

⚠ CAUTION Indicates a hazardous situation that, if not avoided, could result in minor or moderate personal injury.

NOTICE Indicates information considered important, but not hazard related (e.g. messages related to property damage). Please note that the Safety Alert Symbol will not be used with the signal word.

1.1 Safety Precautions

⚠ WARNING

Failure to observe and comply with the following precautions could result in death or serious personal injury. Property damage could also occur.

- Read and completely understand the safety precautions and instructions in this manual before operating the tools or preparing them for use. Always follow all safety precautions and instructions, including those that are contained within the procedures of this manual.
- Be sure the operator has completed safety induction training, specific to the work surroundings. The operator should be thoroughly familiar with the controls and the proper use of the tool.
- Wear personal protective gear when operating hydraulic equipment. Always wear eye protection. Safety equipment such as dust mask, non-skid safety shoes, hard hats, gloves, or hearing protection (used as appropriate) will reduce personal injuries. The protective clothing must not interfere with safe operation of the tool or restrict the ability to communicate with co-workers.
- Operating procedures will vary, depending on the system arrangement. Always read, follow, and completely understand all manufacturers' instructions when operating pumps, valves and all other devices used with the tools. Follow all safety precautions contained in the manufacturer's manuals. Use only for intended purpose.
- To minimize risk of personal injury, keep hands and feet away from the tool and workpiece during operation.
- Maximum allowable pressure for the FA (ATM) Series is 10,000 psi [690 bar]. Do not exceed this pressure setting.
- Do not overload equipment. The system operating pressure must not exceed the pressure rating of the lowest rated component in the system.
- Never apply pressure to a damaged hose, doing so may cause it to rupture.
- Immediately replace worn or damaged parts. Use only genuine Equalizer parts from approved distributors or service centers. Equalizer parts have been engineered and manufactured to be fit-for-purpose.

- Do not handle pressurized hoses or couplings; escaping oil under pressure can penetrate the skin, causing serious injury. Seek medical attention immediately if oil penetration is suspected.
- Only pressurize complete and fully connected hydraulic systems. Do not pressurize systems that contain unconnected couplers.
- Hydraulic circuit must be at zero pressure before couplings are disconnected.
- Never leave the system unattended when under pressure. When the system is under pressure DO NOT STAND IN LINE with the direction of force of the tools. This is a danger area. Always keep this area clear of personnel when the system is under pressure.
- Site pump on a secure, flat, level surface. Rope off working area and place warning signs.
- Do not tamper with air pressure relief safety valve on pump.
- Do not remove gauge covers when fitted.
- Check the date of the calibration certification. If the recalibration date has passed, the gauge must be recalibrated.
- If air supply is interrupted, turn off air stop valve on pump.
- Never strike the tool while it is pressurized or under load. Components under tension may become dislodged, allowing them to become dangerous projectiles. Uncontrolled release of pressurized hydraulic oil could also occur.
- It is advised that a pressure gauge(s) is installed in the system to monitor operating pressure, to allow the operator to monitor what is happening in the system.
- Care should be taken when using the lanyard to avoid entanglement with body parts.

⚠ CAUTION

Failure to observe and comply with the following precautions could result in minor or moderate personal injury. Property damage could also occur.

- Ensure components are protected from external sources of damage, such as excessive heat, flame, moving machine parts, sharp edges, and corrosive chemicals.
- Take care to avoid sharp bends and kinks in hydraulic hoses. Bends and kinks can cause severe back-up pressure and cause hose failure. Protect hoses from dropped objects; a sharp impact may cause internal damage to hose wire strands. Protect hoses from crush risks, such as heavy objects or vehicles; crush damage can cause hose failure.

- Do not lift hydraulic equipment by the hoses or couplers. Use only the designated carrying handles.
- Lubricate tools as directed in this manual prior to operation. Use only approved lubricants of high quality, following the lubricant manufacturer's instructions.
- Only use the designated anchor point for fixing the lanyard. Do not attach the lanyard to the plastic handle.

NOTICE

Failure to observe and comply with the following precautions could result in property damage and/or void the product warranty.

- Hydraulic equipment must only be serviced by a qualified hydraulic technician. For repair service, contact the Equalizer Authorized Service Centre in your area.
- It is strongly recommended that operators always use Equalizer pumps and hoses.
- Always use Equalizer replacement parts.
- Always follow the inspection and maintenance instructions contained in this manual. Perform inspection and maintenance after use, and at regular intervals.
- Rope off working area and place warning signs.
- To help ensure proper operation and best performance, use of Equalizer oil is strongly recommended
- The vibration total value to which this tool is subjected does not exceed 2.5 m/s².

2. Compliance Statement(s)

2.1 Conformance to National and International Standards

- FA1TMSTD (ATM2) •FA4TMSTD (ATM4)
- FA9TESTD (ATM9)



These tools conform with the requirements for CE and UKCA.

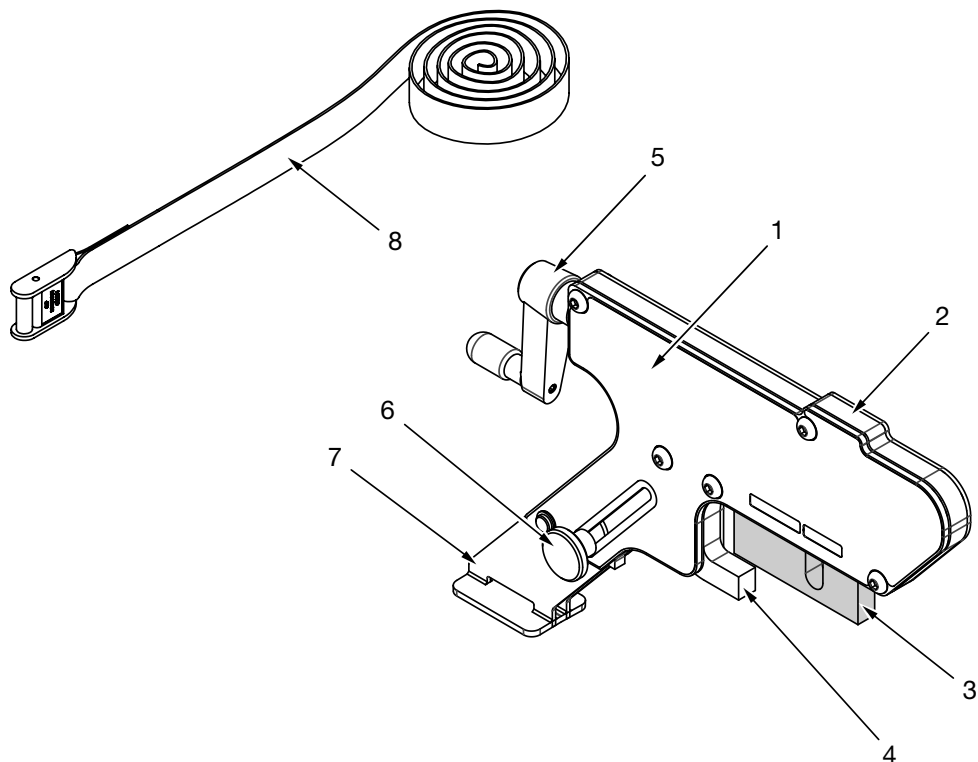
Equalizer declares that the product(s) have been tested and conforms to applicable standards and the product(s) are compatible to all EU and UK Requirements.

Copies of the EU Declaration as well as the UK Self-Declaration are enclosed with each shipment.

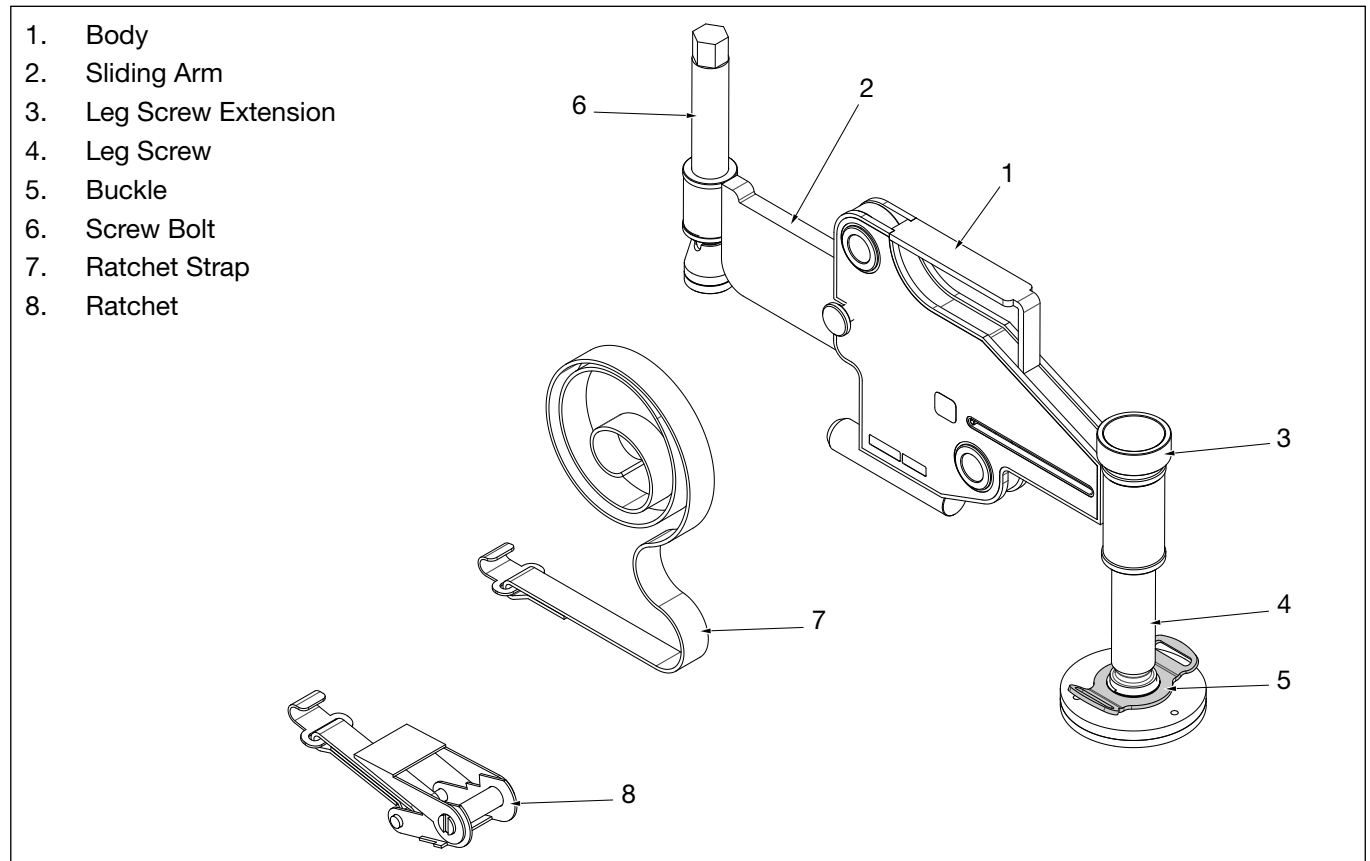
3. Features & Components

3.1 FA1TMSTD (ATM2) Feature Diagram

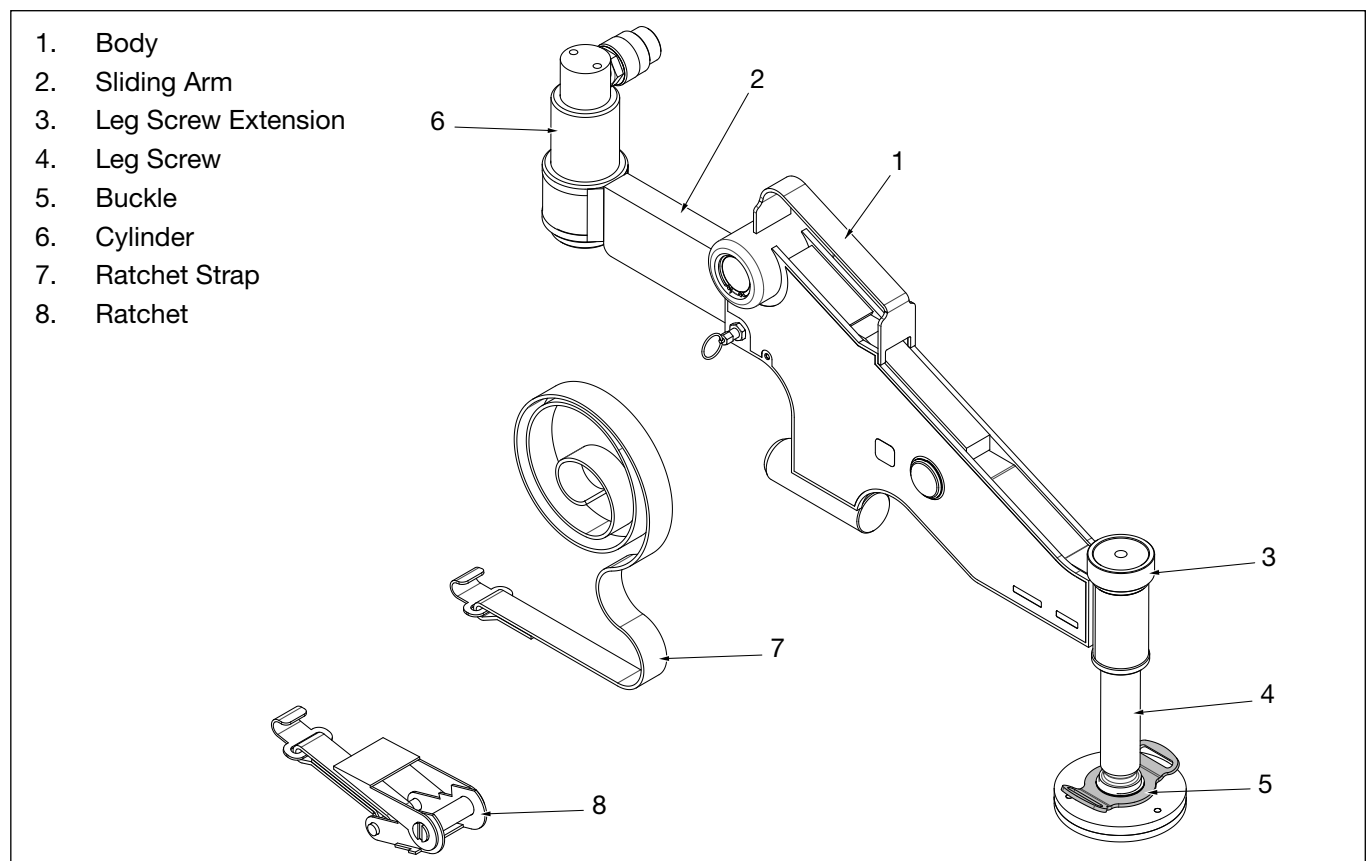
1. Cover Plate
2. Body Frame
3. Driven Wedge
4. Lift Hook
5. Crank Handle
6. Release Knob
7. Drop Leg
8. Ratchet Strap



3.2 FA4TMSTD (ATM4) Feature Diagram



3.3 FA9TESTD (ATM9) Feature Diagram



3.4 Tool Capabilities

3.4.1 FA1TMSTD (ATM2) Aligning Force

Maximum aligning force of tool = 1 T [10 kN]

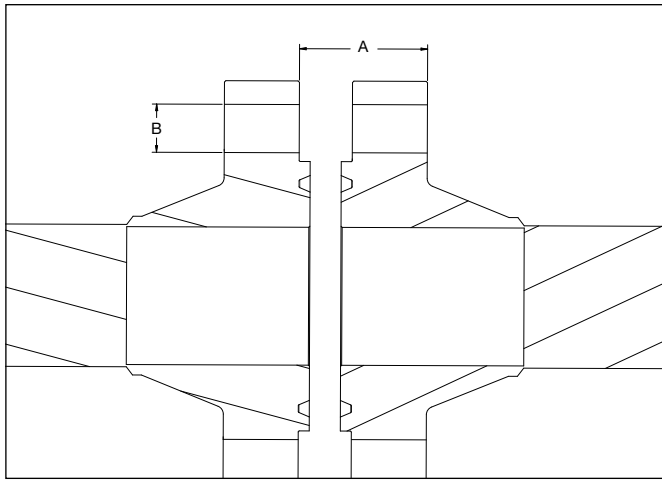
3.4.2 FA4TMSTD (ATM4) Aligning Force

Maximum SWL torque of 68 Nm [50 ft·lb] will generate 4 T [40 kN] aligning force.

3.4.3 FA9TESTD (ATM9) Aligning Force

With 700 bar [10 000 psi] of hydraulic pressure applied, the tool can apply 9 T [90 kN] aligning force.

3.5 Range Of Application



3.5.1 FA1TMSTD (ATM2)

MINIMUM AND MAXIMUM FLANGE SIZES

Dimension A: must be between 14 mm and 82 mm [0.55" and 3.23"].

Dimension B: bolt-hole diameter must be 16 mm [0.63"] or greater.

3.5.2 FA4TMSTD (ATM4)

MINIMUM AND MAXIMUM FLANGE SIZES

Dimension A: must be between 30 mm and 133 mm [1.18" and 5.23"]

Dimension B: bolt-hole diameter must be 24 mm [0.94"] or greater.

3.5.3 FA9TESTD (ATM9)

MINIMUM AND MAXIMUM FLANGE SIZES

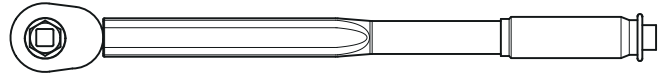
Dimension A: must be between 93 mm and 228 mm [3.66" and 8.98"].

Dimension B: bolt-hole diameter must be 35.5 mm [1.40"] or greater.

3.6 FA4TMSTD (ATM4) TOOL FUNCTION

MECHANICAL TOOL OPERATION

The FA4TMSTD (ATM4) Alignment tool uses mechanical torque to advance the screw bolt and align the flanges. The torque is applied using the supplied Torque Wrench, enabling accurate control of the force applied.



TORQUE WRENCH USAGE

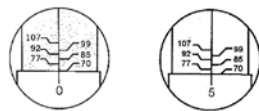
Holding the Torque Wrench in one hand, unlock the knurled handle by turning the locking knob anti-clockwise.

Select the torque setting by turning the knurled handle until the required torque value is indicated.

For example, to set the Torque Wrench to 46 Nm: turn the knurled handle until the 0 on the fine scale aligns with 40 Nm on base scale; now turn slightly further until the 6 on the fine scale aligns with the central line.



Setting an imperial torque [in ft·lb] is done in exactly the same way.



Lock the handle by turning the locking knob clockwise. Do not attempt to turn the grip while it is locked.

Install the supplied socket onto the Torque Wrench and attach to the tool.

Slowly and smoothly pull the handle, gradually applying more force until you feel or hear the Torque Wrench click, indicating that the selected torque has been achieved. Do not continue to apply force after the Torque Wrench has clicked. Special care should be taken when using low torque settings.

TORQUE WRENCH CARE

Prior to storing the Torque Wrench, and between use, leave the Torque Wrench with its lowest torque setting selected.

To clean the Torque Wrench, wipe gently with a damp cloth. Avoid using any detergent or solvent as this may detrimentally affect the factory-fitted internal lubrication of the mechanism.

3.7 Kit Contents

3.7.1 FA1TMSTD (ATM2)

STANDARD KIT

- 1 x FA1TMSTD (ATM2) Tool
- 1 x Mini Ratchet Strap
- 1 x Instruction Manual

Case Dimensions:

180.0mm x 330.0mm x 220.0mm [7.1" x 13.0" x 8.7"]

Tool only Weight: 2.1 kg [4.63 lb]

Gross Kit Weight: 2.3 kg [5.07 lb]

3.7.2 FA4TMSTD (ATM4)

STANDARD KIT

- 1 x FA4TMSTD (ATM4) Tool
- 1 x 68 Nm [50 ft·lb] Torque Wrench with 22 mm socket
- 1 x Ratchet and Strap
- 1 x Instruction Manual
- 1 x Carry-Case

Case Dimensions:

600 mm x 370 mm x 200 mm [23.6" x 14.6" x 7.9"]

Tool only Weight: 8.6 kg [19.0 lb]

Gross Kit Weight: 12.2 kg [26.9 lb]

3.7.3 FA9TESTD (ATM9)

STANDARD KIT

- 1 x FA9TESTD (ATM9) Tool
- 1 x 700 bar [10 000 psi] HP350S Hydraulic Hand Pump
- 1 x 2.0 m [78.74"], 700 bar [10 000 psi] Hydraulic Hose
- 1 x Ratchet and Strap
- 1 x Instruction Manual
- 1 x Carry-Case

Case Dimensions:

920 mm x 520 mm x 210 mm [36.2" x 20.5" x 8.3"]

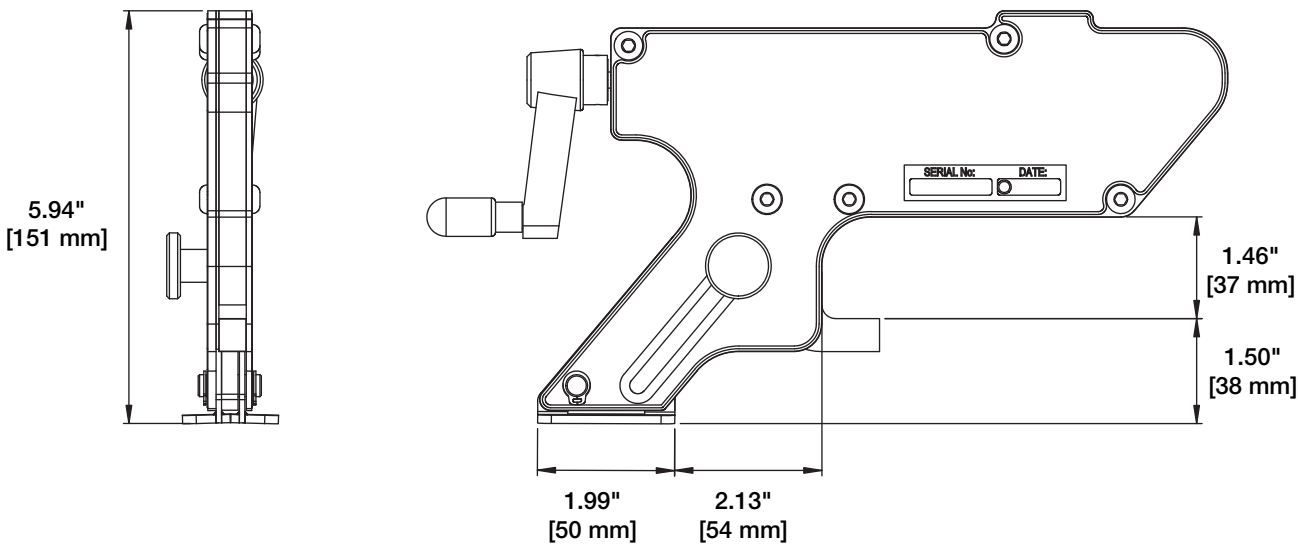
Tool only Weight: 14.5 kg [32.0 lb]

Gross Kit Weight: 26.5 kg [58.4 lb]

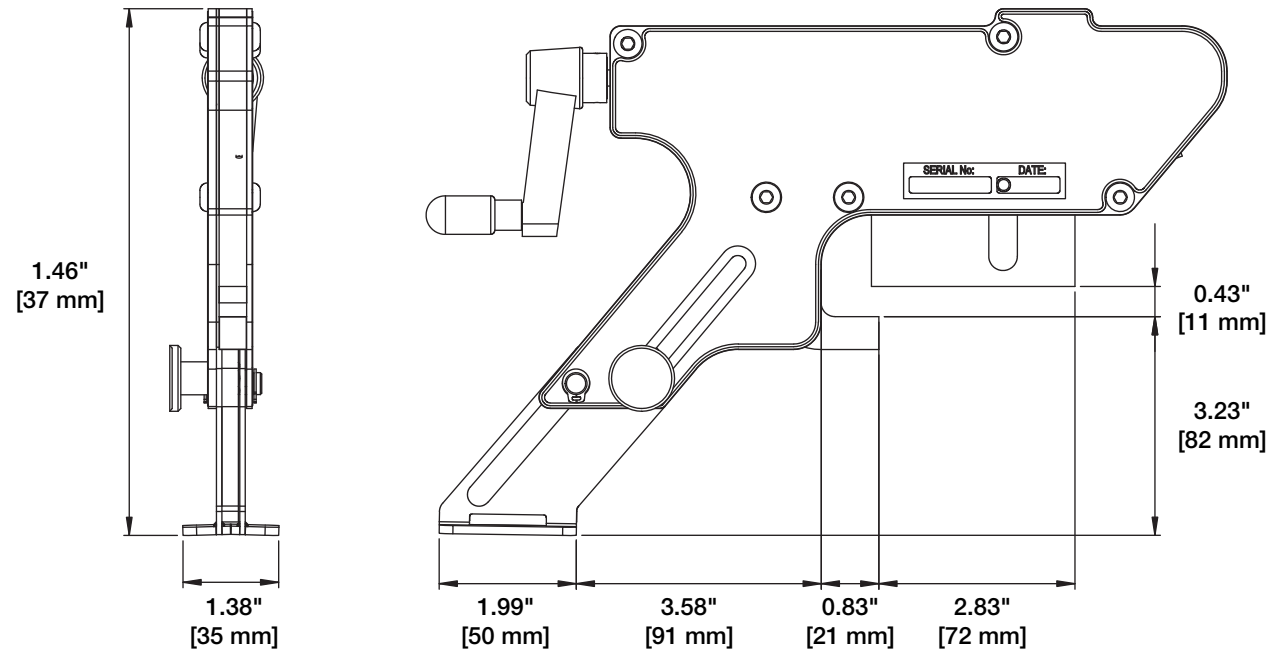
4. Technical Product Data

4.1 FA1TMSTD (ATM2) Dimensions

MINIMUM EXTENSION

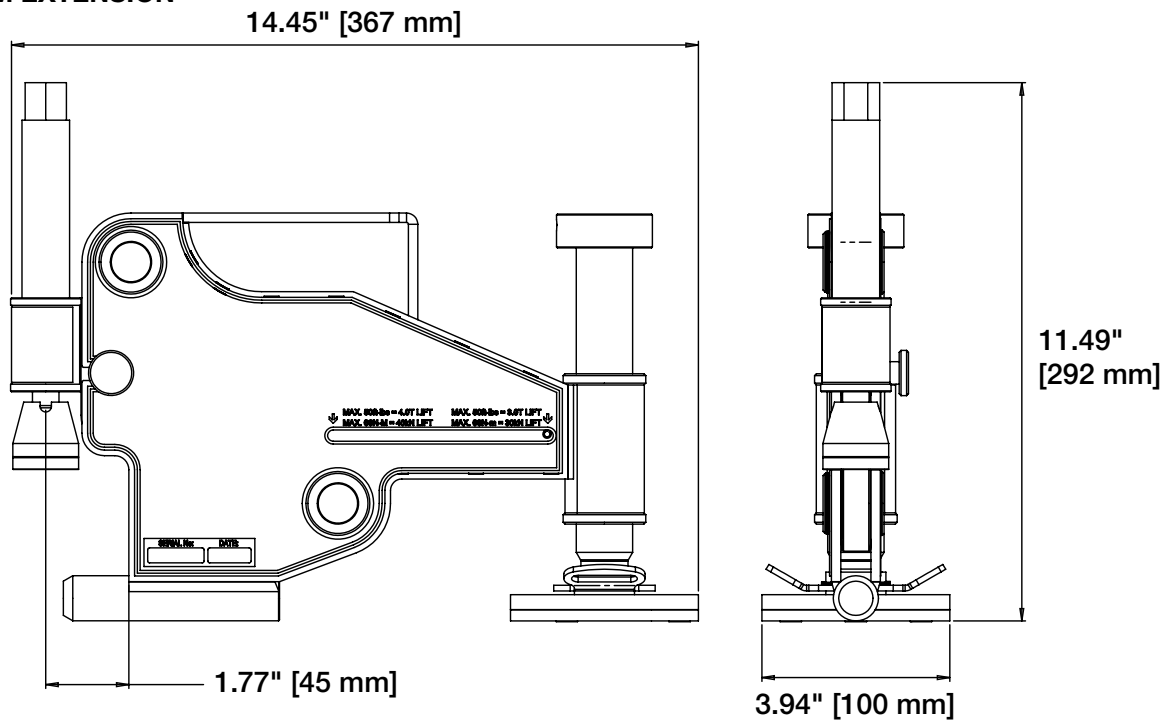


MAXIMUM EXTENSION

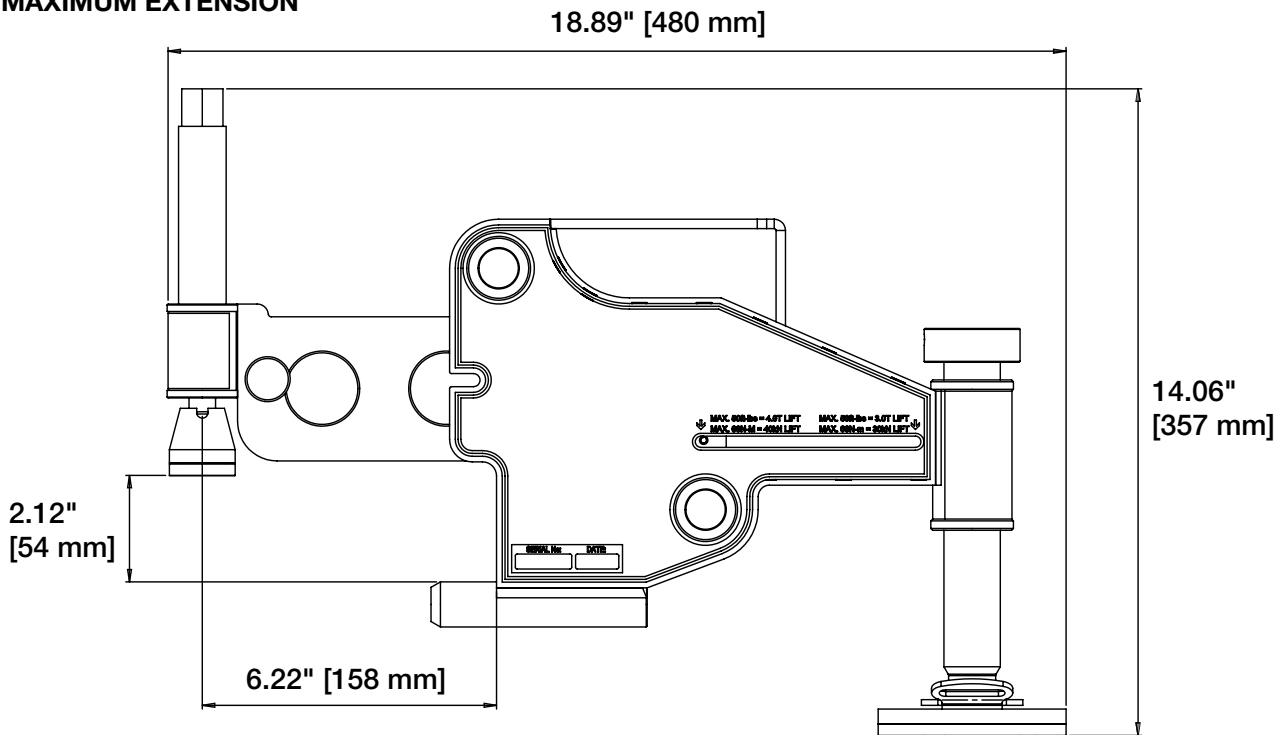


4.2 FA4TMSTD (ATM4) Dimensions

MINIMUM EXTENSION

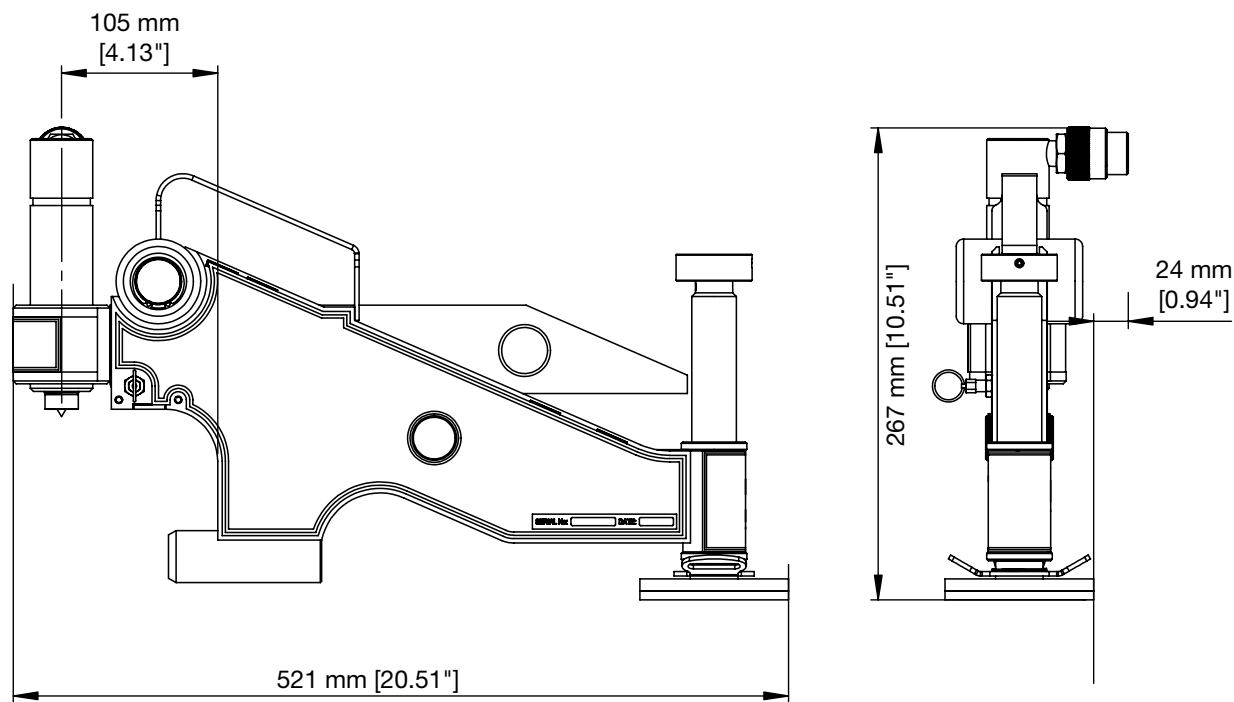


MAXIMUM EXTENSION

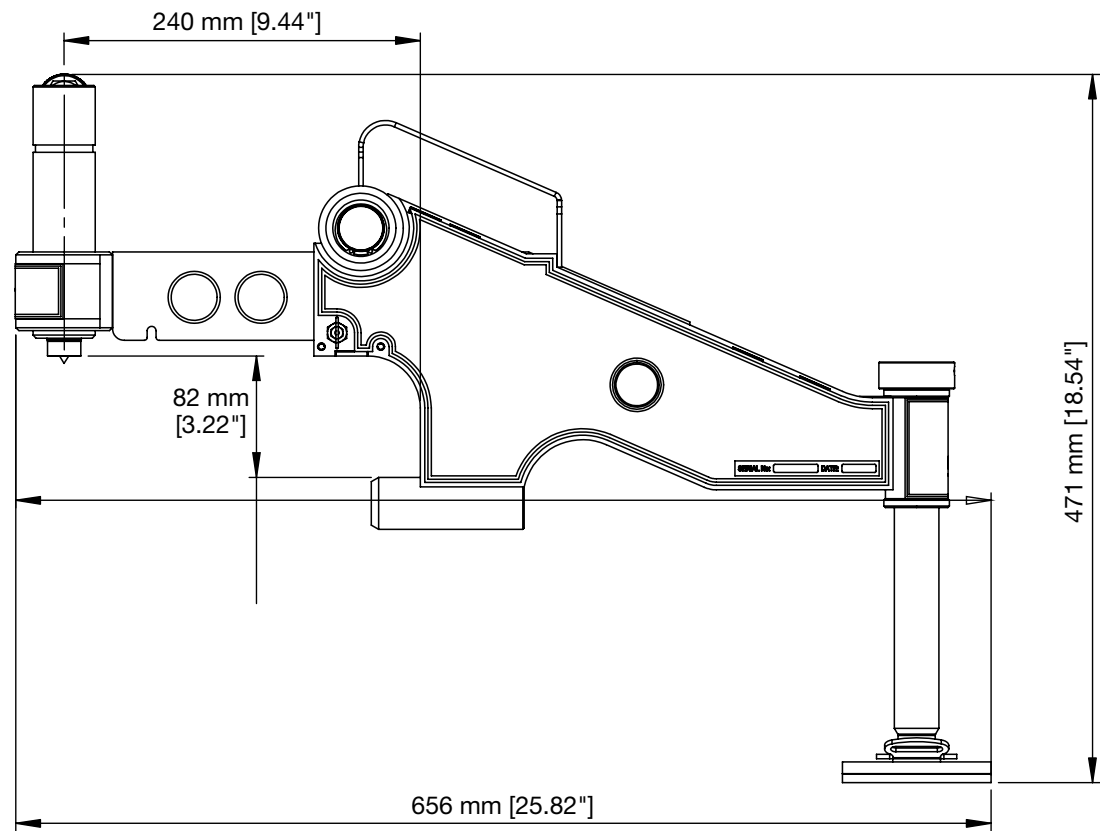


4.3 FA9TESTD (ATM9) Dimensions

MINIMUM EXTENSION



MAXIMUM EXTENSION



L4769_c

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	FA1TMSTD (ATM2)																				FA1TMSTD (ATM2)		FA1T- MSTD (ATM2)	FA1TMSTD (ATM4)	FA4TMSTD (ATM4)																
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"			
	TOOL	FA1TMSTD (ATM2)																				FA4TMSTD (ATM4)				FA9TESTD (ATM9)																
CLASS E	NPS	1 1/4"	1 1/2"	2"	2 1/2"	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"					
	TOOL					FA1TMSTD (ATM2)																FA4TMSTD (ATM4)										FA9TESTD (ATM9)										
CLASS F	NPS	1 1/4"	1 1/2"	2"	2 1/2"	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"					
	TOOL					FA1TMSTD (ATM2)																FA4TMSTD (ATM4)										FA9TESTD (ATM9)										
CLASS H	NPS	1 1/4"	1 1/2"	2"	2 1/2"	3"	1/2"	4"	5"	6"	7"	8"	9"	10"	12"	13"	14"	15"	16"	17"	18"	19"	20"	21"	22"	23"	24"															
	TOOL					FA1TMSTD (ATM2)																FA4TMSTD (ATM4)																				
CLASS J	NPS	1 1/4"	1 1/2"	2"	2 1/2"	3"	1/2"	4"	5"	6"	7"	8"	9"	10"	12"	13"	14"	15"	16"	17"	18"	19"	20"	21"	22"	23"	24"															
	TOOL					FA1TMSTD (ATM2)																FA4TMSTD (ATM4)										FA9TESTD (ATM9)										
CLASS K	NPS	1 1/4"	1 1/2"	2"	2 1/2"	3"	1/2"	4"	5"	6"	7"	8"	9"	10"	12"	13"	14"	15"	16"	17"	18"	19"	20"																			
	TOOL					FA1TMSTD (ATM2)																FA4TMSTD (ATM4)										FA9TESTD (ATM9)										
CLASS R	NPS	1 1/4"	1 1/2"	2"	2 1/2"	3"	1/2"	4"	5"	6"	7"	8"	9"	10"	12"	13"	14"	15"	16"	17"	18"	19"	20"																			
	TOOL					FA1TMSTD (ATM2)																FA4TMSTD (ATM4)										FA9TESTD (ATM9)										
CLASS S	NPS	1 1/2"	3/4"	1"	1 1/4"	1 1/2"	2"	2 1/2"	3"	1/2"	4"	5"	6"	7"	8"	9"	10"	11"	12"	13"	14"	15"	16"																			
	TOOL					FA1TMSTD (ATM2)																FA4TMSTD (ATM4)				FA9TESTD (ATM9)																
CLASS T	NPS	1/2"	3/4"	1"	1 1/4"	1 1/2"	2"	2 1/2"	3"	1/2"	4"	5"	6"	7"	8"	9"	10"	11"	12"	13"																						
	TOOL	FA1TMSTD (ATM2)				FA4TMSTD (ATM4)				FA9TESTD (ATM9)																																
Note: Models FA1TMSTD (ATM2) and FA4TMSTD (ATM4) shown for reference purposes only.																																										

[illegible]

CLASS 2K	TOOL		FA1TMS1D (ATM2)		FA4TMS1D (ATM4)							
	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"
CLASS 3K	TOOL		FA1TMS1D (ATM2)		FA4TMS1D (ATM4)		FA9TEST1D (ATM9)					
	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"
CLASS 6K	TOOL		FA1TMS1D (ATM2)		FA4TMS1D (ATM4)		FA9TEST1D (ATM9)					
	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"

SUITABLE FOR ENERPAC FA1TMSTD (ATM2) TOOL
SUITABLE FOR ENERPAC FA4TMSTD (ATM4) TOOL
SUITABLE FOR ENERPAC FA9TESTD (ATM9) TOOL
NOT SUITABLE FOR ANY ENERPAC ATM TOOL

ASME B16.5 Flange Range of Application

CLASS 150	NPS	3/4"	1"	1"	1"	2"	2"	3"	3"	4"	5"	6"	8"	10"	12"	14"	16"	18"	20"	24"
	TOOL				FA1TMSTD (ATM2)										FA4TMSTD (ATM4)					
CLASS 300	NPS	3/4"	1"	1"	1"	2"	2"	3"	3"	4"	5"	6"	8"	10"	12"	14"	16"	18"	20"	24"
	TOOL				FA1TMSTD (ATM2)										FA4TMSTD (ATM4)					
CLASS 400	NPS	3/4"	1"	1"	1"	2"	2"	3"	3"	4"	5"	6"	8"	10"	12"	14"	16"	18"	20"	24"
	TOOL				FA1TMSTD (ATM2)										FA4TMSTD (ATM4)					
CLASS 600	NPS	3/4"	1"	1"	1"	2"	2"	3"	3"	4"	5"	6"	8"	10"	12"	14"	16"	18"	20"	24"
	TOOL				FA1TMSTD (ATM2)										FA4TMSTD (ATM4)					
CLASS 900	NPS	1/2"	3/4"	1"	1"	1"	2"	2"	3"	4"	5"	6"	8"	10"	12"	14"	16"	18"	20"	24"
	TOOL	FA1TMSTD (ATM2)	FA4TMSTD (ATM4)										FA9TESTD (ATM9)							
CLASS 1500	NPS	1/2"	3/4"	1"	1"	1"	2"	2"	3"	4"	5"	6"	8"	10"	12"	14"	16"	18"	20"	24"
	TOOL	FA1TMSTD (ATM2)	FA4TMSTD (ATM4)										FA9TESTD (ATM9)							
CLASS 2500	NPS	1/2"	3/4"	1"	1"	1"	2"	2"	3"	4"	5"	6"	8"	10"	12"	14"	16"	18"	20"	24"
	TOOL	FA1TMSTD (ATM2)	FA4TMSTD (ATM4)										FA9TESTD (ATM9)							

ASME B16.47 Flange Range of Application

CLASS 150	NPS	22"	26"	28"	30"	32"	34"	36"	38"	40"	42"	44"	46"	48"
	TOOL		FA4TMSTD (ATM4)				FA9TESTD (ATM9)							
CLASS 300	NPS	22"	26"	28"	30"	32"	34"	36"	38"	40"	42"	44"	46"	48"
	TOOL		FA4TMSTD (ATM4)				FA9TESTD (ATM9)							
CLASS 400	NPS	22"	26"	28"	30"	32"	34"	36"	38"	40"	42"	44"	46"	48"
	TOOL		FA4TMSTD (ATM4)				FA9TESTD (ATM9)							
CLASS 600	NPS	22"	26"	28"	30"	32"	34"	36"	38"	40"	42"	44"	46"	48"
	TOOL		FA4TMSTD (ATM4)				FA9TESTD (ATM9)							
CLASS 900	NPS	22"	26"	28"	30"	32"	34"	36"	38"	40"	42"	44"	46"	48"
	TOOL		FA4TMSTD (ATM4)				FA9TESTD (ATM9)							

DIN Weld Neck Flange Range of Application

CLASS PN16	NPS	1 1/2"	2"	3"	4"	5"	6"	7"	8"	10"	12"	14"	16"	18"	20"	24"	28"	32"	36"	40"	48"	56"	72"	80"
	TOOL				FA1TMSTD (ATM2)																		FA9TESTD (ATM9)	
CLASS PN25	NPS	1/2"	3/4"	1"	1 1/4"	1 1/2"	2"	3"	4"	5"	6"	7"	8"	10"	12"	14"	16"	18"	20"	24"	28"	32"	36"	40"
	TOOL						FA1TMSTD (ATM2)																	
CLASS PN40	NPS	1 1/2"	2"	3"	4"	5"	6"	7"	8"	10"	12"	14"	16"	18"	20"									
	TOOL						FA1TMSTD (ATM2)																	
CLASS PN54	NPS	3/4"	1"	1 1/2"	2"	3"	4"	5"	6"	7"	8"	10"	12"	14"	16"									
	TOOL						FA1TMSTD (ATM2)																	
CLASS PN100	NPS	1/2"	3/4"	1"	1 1/2"	2"	3"	4"	5"	6"	7"	8"	10"	12"	14"									
	TOOL						FA1TMSTD (ATM2)																	
CLASS PN160	NPS	3/8"	1/2"	3/4"	1"	1 1/2"	2"	3"	4"	5"	6"	7"	8"	10"	12"									
	TOOL						FA1TMSTD (ATM2)																	

	SUITABLE FOR ENERPAC FA1TMSTD (ATM2) TOOL
	SUITABLE FOR ENERPAC FA4TMSTD (ATM4) TOOL
	SUITABLE FOR ENERPAC FA9TESTD (ATM9) TOOL
	NOT SUITABLE FOR ANY ENERPAC ATM TOOL

Note: Models FA1TMSTD (ATM2) and FA4TMSTD (ATM4) shown for reference purposes only.

SPO Flange Range of Application

CLASS 150	TOOL\NPS	2 1/2"	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											FA1TMSTD (ATM2)										FA4TMSTD (ATM4)					
CLASS 300	TOOL\NPS	2 1/2"	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											FA1TMSTD (ATM2)										FA4TMSTD (ATM4)					
CLASS 600	TOOL\NPS	2 1/2"	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											FA4TMSTD (ATM4)										FA9TESTD (ATM9)					
CLASS 900	TOOL\NPS	2 1/2"	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											FA4TMSTD (ATM4)										FA9TESTD (ATM9)					
CLASS 1500	TOOL\NPS	2 1/2"	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											FA4TMSTD (ATM4)										FA9TESTD (ATM9)					
CLASS 2500	TOOL\NPS	2 1/2"	3 1/2"	4"	5"	6"	8"	10"	12"	14"	16"	18"	20"	22"	24"												
	TOOL											FA4TMSTD (ATM4)										FA9TESTD (ATM9)					
CLASS 5000	TOOL\NPS	2 1/2"	3 1/2"	4"	5"	6"	8"	10"	12"	14"	16"	18"	20"	22"	24"												
	TOOL											FA4TMSTD (ATM4)										FA9TESTD (ATM9)					
CLASS 7500	TOOL\NPS	2 1/2"	3 1/2"	4"	5"	6"	8"	10"	12"	14"	16"	18"	20"	22"	24"												
	TOOL											FA4TMSTD (ATM4)										FA9TESTD (ATM9)					
CLASS 10000	TOOL\NPS	2 1/2"	3 1/2"	4"	5"	6"	8"	10"	12"	14"	16"	18"	20"	22"	24"												
	TOOL											FA4TMSTD (ATM4)										FA9TESTD (ATM9)					
CLASS 15000	TOOL\NPS	2 1/2"	3 1/2"	4"	5"	6"	8"	10"	12"	14"	16"	18"	20"	22"	24"												
	TOOL											FA4TMSTD (ATM4)										FA9TESTD (ATM9)					

Note: Models FA1TMSTD (ATM2) and FA4TMSTD (ATM4) shown for reference purposes only.

	SUITABLE FOR ENERPAC FA1TMSTD (ATM2) TOOL
	SUITABLE FOR ENERPAC FA4TMSTD (ATM4) TOOL
	SUITABLE FOR ENERPAC FA9TESTD (ATM9) TOOL
	NOT SUITABLE FOR ANY ENERPAC ATM TOOL

6. Operation

6.1 Flange Misalignment Determination Procedure

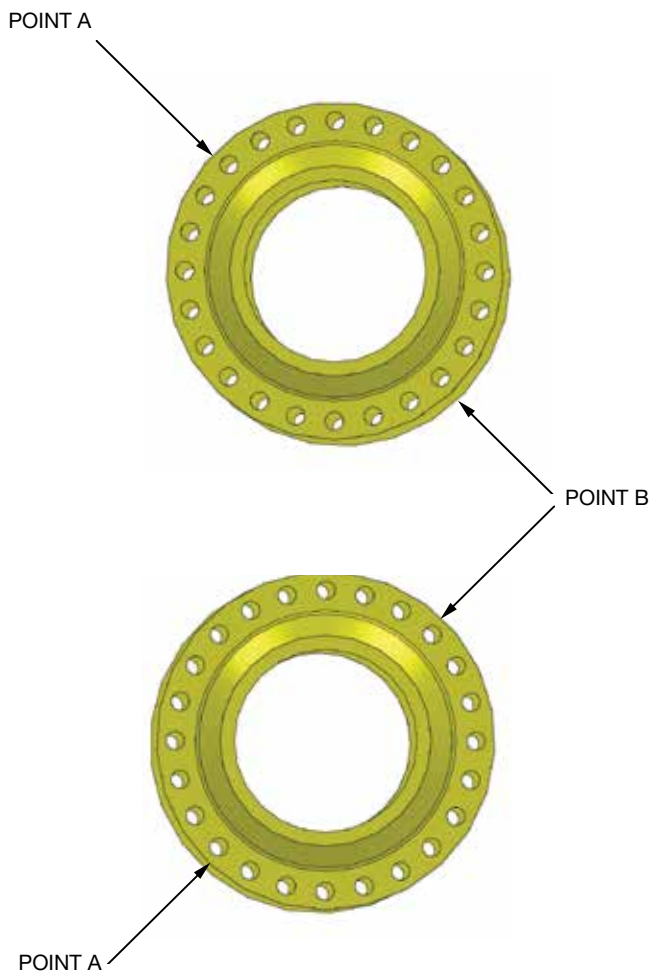
The tool being used must not be attached to a flanged joint prior to the misalignment procedure being carried out.

6.2 Lateral Misalignment

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.

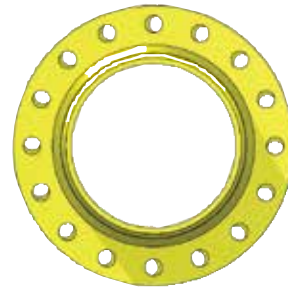
2. At this point the direction of any misalignment should become obvious. The alignment tool being used should be attached at the maximum point of misalignment (point A or B in the examples shown below).



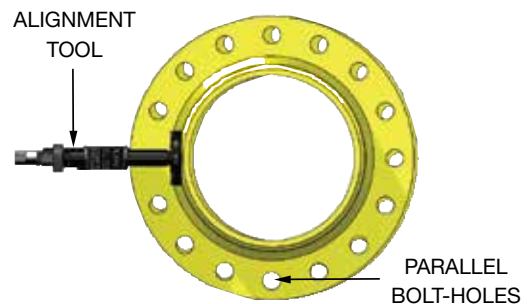
6.3 Rotational (Twist) Misalignment

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.

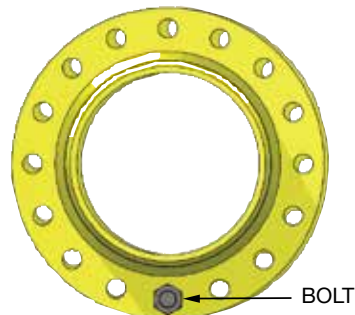
In this case the alignment tool can be attached to the most accessible point as misalignment occurs at all bolt-holes to the same degree.



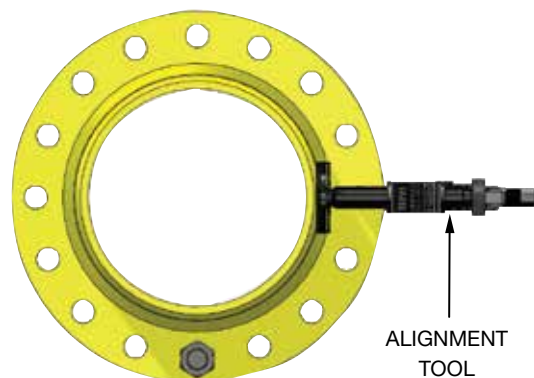
1. Attach the alignment tool at the most accessible/ convenient point (as shown in sections) and use it to push the flanges out of alignment until one pair of bolt-holes becomes parallel.



2. Insert the bolt into the aligned bolt-hole and release the alignment tool. The load will transfer onto the bolt.



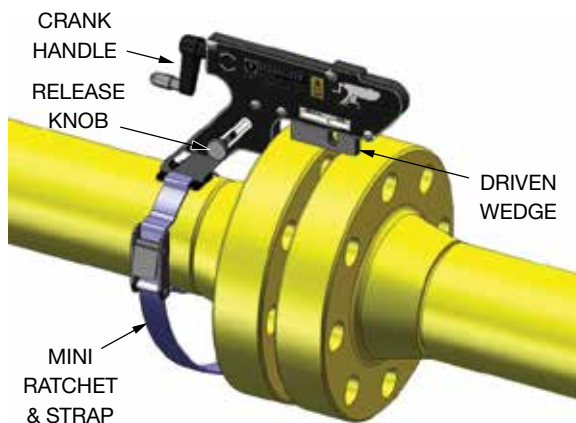
3. Repeat steps 1 and 2 at other points around the flange until all of the remaining bolt-holes are parallel and the rest of the bolts can be inserted.



6.4 FA1TMSTD (ATM2) Operation

6.4.1 FA1TMSTD (ATM2) General Guidance

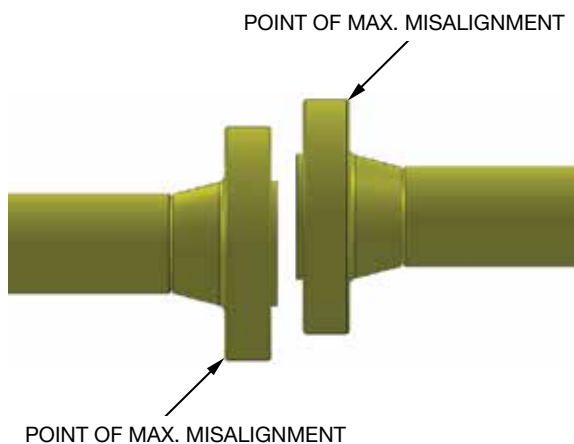
1. The FA1TMSTD (ATM2) is secured to the lower of the two flanges by fully inserting the lift hook into the bolt-hole at the point of greatest misalignment.
2. The drop leg release knob is slackened and the drop leg is adjusted down to the pipe while the tool is held level in the bolt-hole.
3. The drop leg release knob is then tightened until firm.
4. The strap and buckle are attached to the drop leg and around the pipe for added security.
5. The crank handle is then turned clockwise until the driven wedge comes into contact with the circumference of the opposite flange.



6.4.2 FA1TMSTD (ATM2) Actuating The Tool

Carry out the Flange Misalignment Determination Procedure (see section 6.1 to 6.2) to determine the points of maximum misalignment.

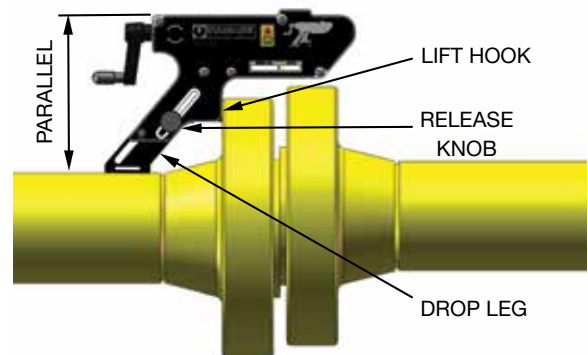
In this example the points of maximum misalignment are the top and bottom of the joint.



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

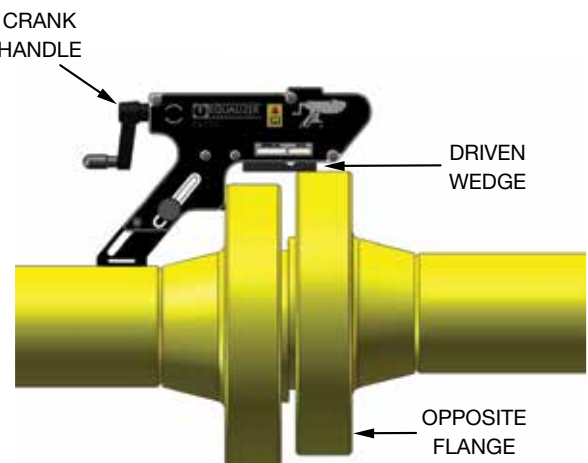
Adjust the drop leg down onto the pipe by slackening the release knob in an anticlockwise direction.

The tool should be held up level within the bolt-hole during adjustment. NB: The tool must be parallel to pipe during operation.

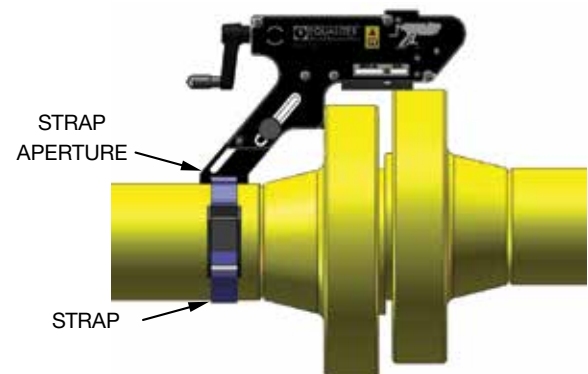


The drop leg release knob is then tightened until firm.

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

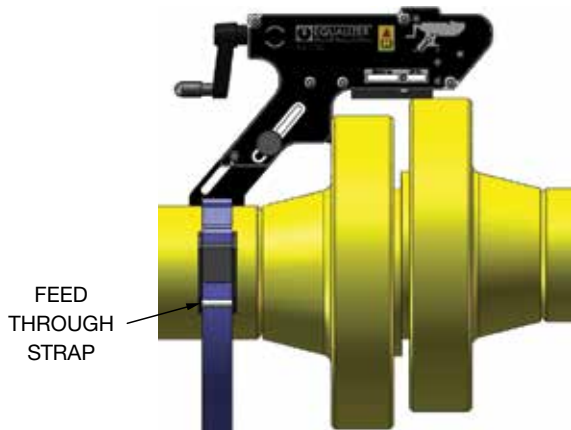


Thread the strap through the aperture on the base of the drop leg as shown.



Feed the open end of the strap through the buckle mechanism as shown.

Close the clasp to secure strap.



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.



WARNING Do not exceed hand pressure on the crank handle

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 FA1TMSTD (ATM2) is located) remove the tool by reversing the previous steps. Insert the last bolt and tighten.

WARNING 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

6.5 FA4TMSTD (ATM4) Operation

6.5.1 FA4TMSTD (ATM4) General Guidance

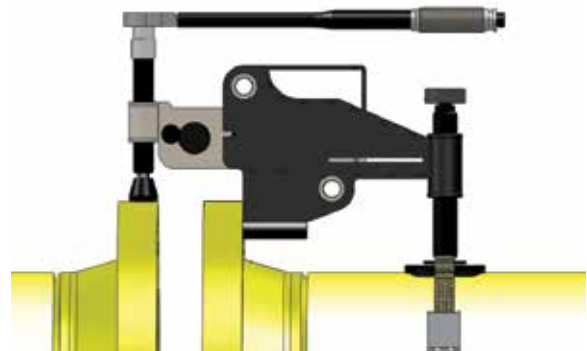
The FA4TMSTD (ATM4) is secured to the lower of the two flanges by fully inserting the lift hook into the bolt-hole at the point of greatest misalignment.

The drop leg is adjusted down to the pipe while the tool is held level in the bolt-hole.

The wing retaining screw is loosened to allow the wing to be extended out.

The screw bolt is turned clockwise until the friction pad comes into contact with the circumference of the opposite flange.

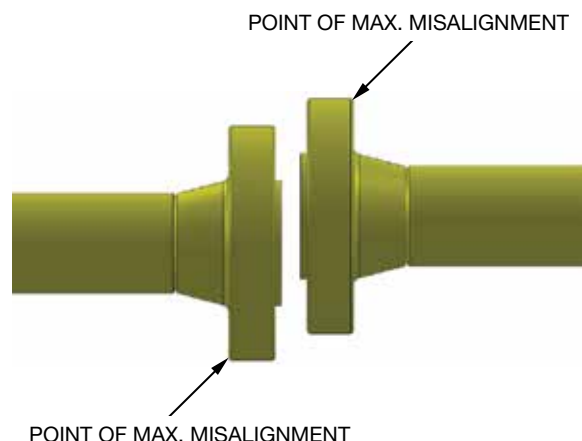
The torque wrench is set to 68 Nm [50 ft·lb] (max), attached to the screw bolt and turned to screw down the flange, bringing the joint into alignment.



6.5.2 FA4TMSTD (ATM4) Actuating The Tool

Carry out the Flange Misalignment Determination Procedure (see section 6.1 to 6.3) to determine the points of maximum misalignment.

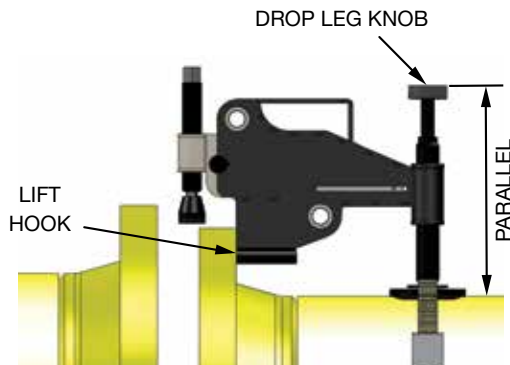
In this example the points of maximum misalignment are the top and bottom of the joint.



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

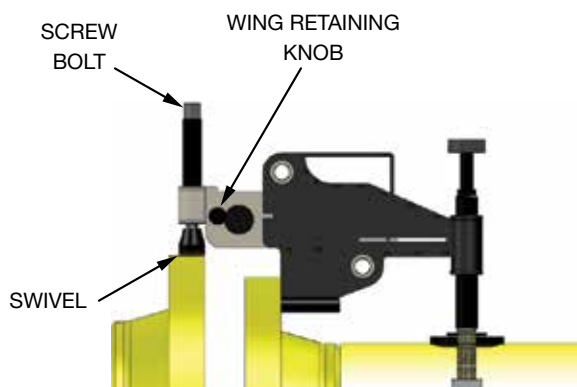
Adjust the drop leg down onto the pipe by turning the adjustment knob in a clockwise direction. The tool should be held up level within the bolt-hole during adjustment.

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

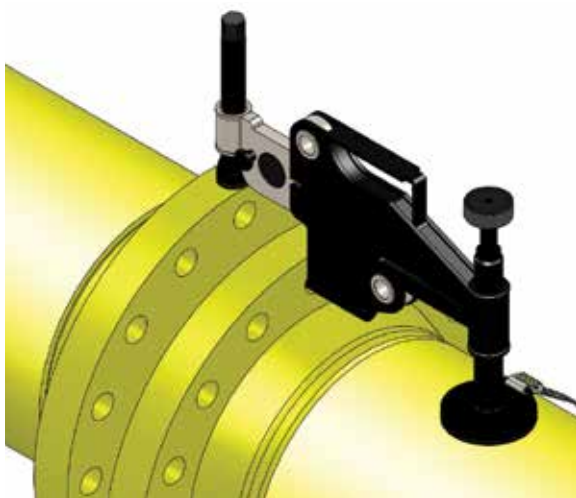


Loosen the wing retaining knob and extend the wing over to the opposite flange.

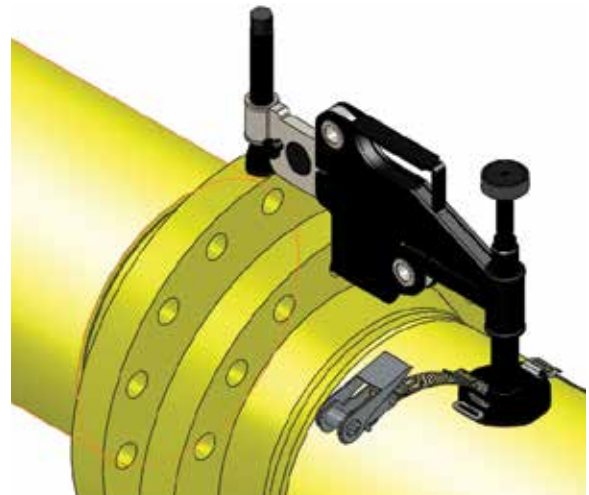
Rotate the screw bolt onto the surface of the opposite flange. Ensure that the tool is sitting level and that the friction pad on the base of the swivel is in full and even contact with the surface of the opposite flange.



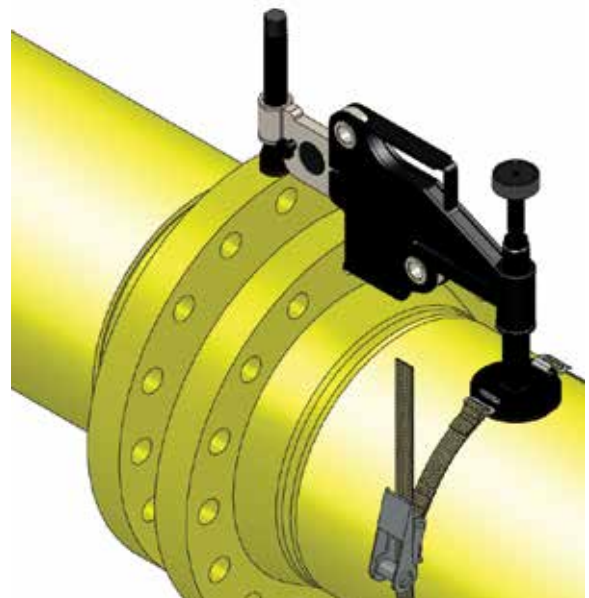
Attach the hook of the strap through the buckle on top of the base plate as shown.



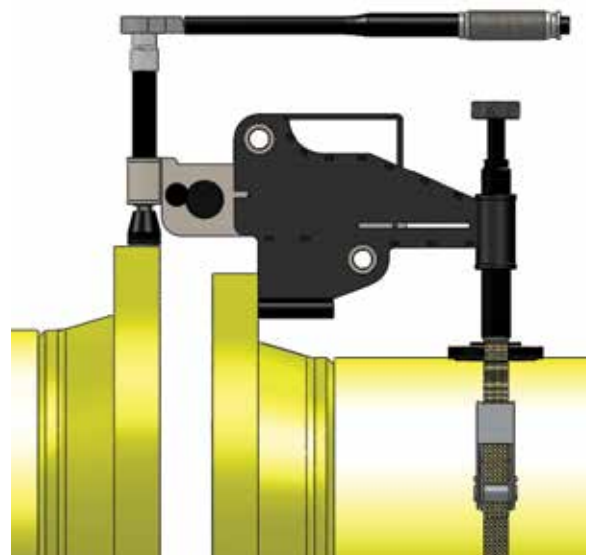
Now place the hook of the ratchet mechanism through the opposite side of the buckle as shown.



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

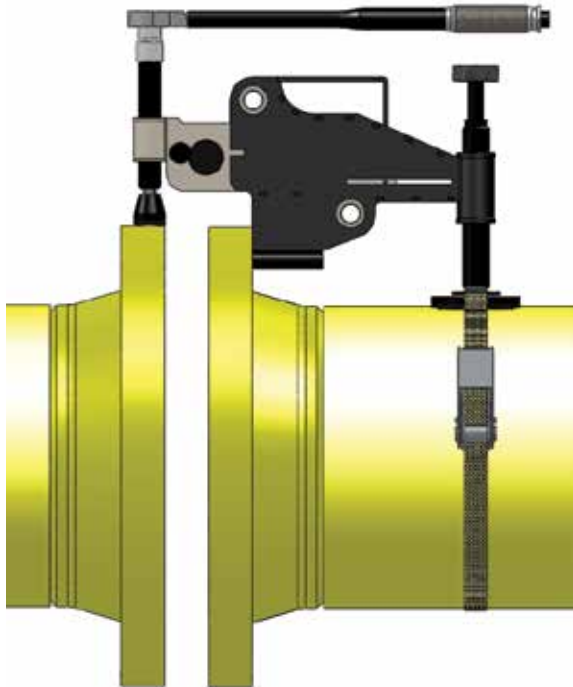


The torque wrench should be set at 19 N·m [14 ft·lb] then attached to the screw bolt.



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 misaligned adjust the torque wrench up to 33 N·m [24 ft·lb] and continue until a maximum torque wrench setting of 68 N·m [50 ft·lb] 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 FA4TMSTD (ATM4) is located), remove the tool by reversing steps 2 - 8.

Insert the last bolt and tighten.

⚠ WARNING The maximum safe working load is 68 N·m [50 ft·lb]. Exceeding 68 N·m [50 ft·lb] will result in damage to the tool.

⚠ WARNING 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.

6.5.3 FA4TMSTD (ATM4) Subsea Usage

Using FA4TMSTD (ATM4) Sub-Sea:

The FA4TMSTD (ATM4) is actuated mechanically and can be used sub-sea providing the following actions are taken:

The tool is actuated via the torque wrench by a diver.

The tool is stripped down, cleaned and lubricated immediately to minimise corrosion.

6.6 FA9TESTD (ATM9) Operation

6.6.1 FA9TESTD (ATM9) General Guidance

The FA9TESTD (ATM9) 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.

The drop leg is adjusted down onto the pipe while the tool is held up level in the bolt hole.

The release knob should be loosened to allow the wing to be extended out to the required distance.

The hydraulic cylinder should then be adjusted down onto the circumference of the flange opposite by rotating it in a clockwise direction.

The hydraulic hose and pump are attached to the cylinder and the hand pump is primed, bringing the joint into alignment.

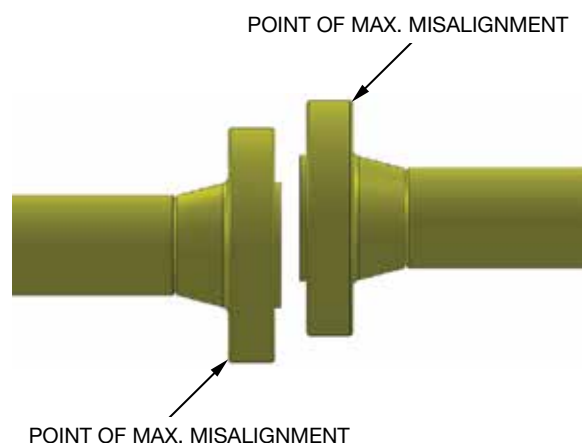


Figure 1:

6.6.2 FA9TESTD (ATM9) Actuating The Tool

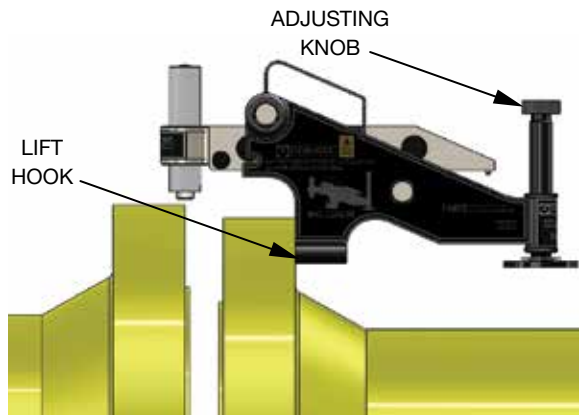
Carry out the Flange Misalignment Determination Procedure (see section 6.1 to 6.3) to determine the points of maximum misalignment.

In this example the points of maximum misalignment are at the top and bottom of the joint.

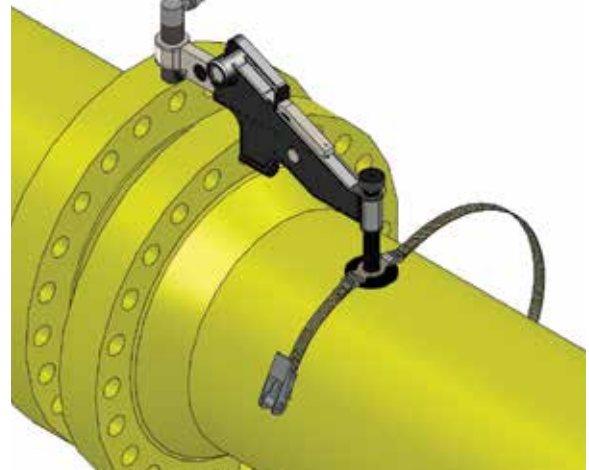


Guide the lift hook into the bolt hole at the point of maximum misalignment.

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



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

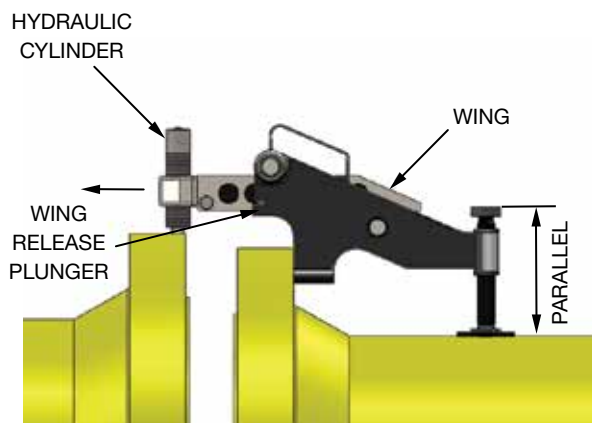


Loosen the wing release knob and extend the wing out to the required distance.

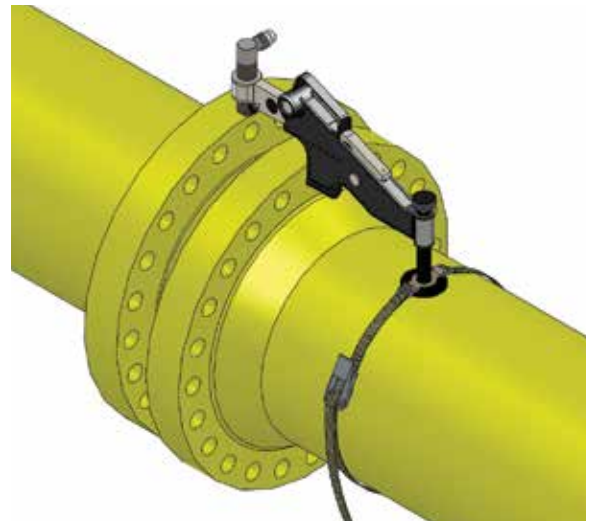
Rotate the hydraulic cylinder down until the base of the cylinder locates onto the surface of the opposite flange.

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

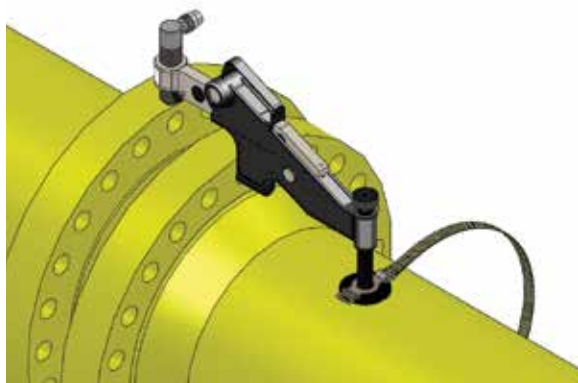
N.B Ensure the tool is parallel to the pipe.



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

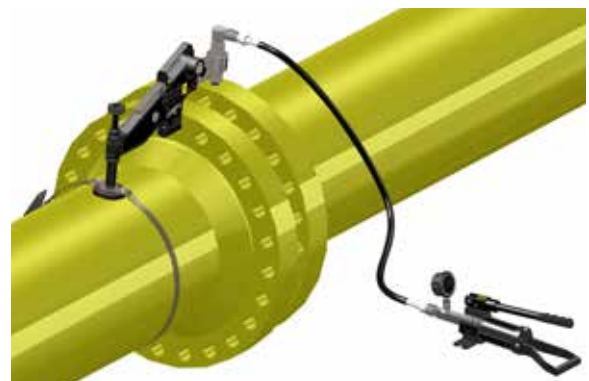


Attach the hook on the strap through the base plate as shown.



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.



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 FA9TESTD (ATM9) is located), remove the tool by reversing the steps above.

Insert the last bolt and tighten.



⚠ WARNING 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.

6.6.3 FA9TESTD (ATM9) Subsea Usage

Using FA9TESTD (ATM9) Sub-Sea:

The FA9TESTD (ATM9) is actuated by means of single acting spring-return hydraulic cylinder and can be used subsea providing the following actions are taken:

- The gauge and manifold are removed from the Equalizer hydraulic hand pump and the coupler is fitted directly to the pump outlet (tools in this configuration can be requested from Equalizer).
- The tool is connected to the Equalizer pump while still top-side.
- The pump release valve is fully opened and remains open until the tool has descended to the working depth. This will allow the pressure to equalise.
- The tool is actuated via the hand pump by a diver.
- Upon completion of works the release valve is left in the fully open position until the tool has ascended to the surface.

Please note that a sub-sea FA9TESTD (ATM9) tool cannot be operated from top-side by use of a down-line. The return springs in the hydraulic cylinders do not have sufficient force to close the tool if used with a downline from a top-side pump, therefore the standard hydraulic tools will not function correctly and may jam in place if used in this configuration.

7. Storage

7.1 Storage and Transportation

Equalizer tools should be stored in a cool, dry place. Tools should always be cleaned, serviced and lubricated prior to storage. Ensure that tools are stored in their designated packing cases.

7.2 Long-Term Storage - Maintenance Plan

1. Rub components down with a dry cloth to remove moisture.
2. Coat EVERY surface and contact point with a corrosion inhibitor. Where necessary, coat inside and outside of component
3. Nuts and threads must also be coated with a corrosion inhibitor.
4. Once surfaces have been coated, seal individual components in clear plastic bags or clear vacuum bags or clear shrink wrap.
5. NOTE: bags/shrink wrap must be clear for visibility. Take care when using shrink wrap that the tool is/ components are still easy to see.
6. Remove all or, where not vacuum sealed, as much air from bags as possible.
7. Once bags have been closed and sealed DO NOT re-open. Any visual inspections must be done with closed and sealed bags. If bags are opened the components will have to be dried, re-coated and re-sealed in bags/shrink wrap.
8. Replace silica gel [100g] EVERY TIME the case is opened.
9. NOTE: depending on moisture content of air, silica gel should be changed weekly.
10. Visually inspect kits after 30-days and every 30-days thereafter. Remember to replace silica gel before closing case.

8. Maintenance

8.1 FA1TMSTD (ATM2) Maintenance

8.1.1 FA1TMSTD (ATM2) Inspection

A thorough inspection should be carried out prior to usage, storage or transportation to ensure the completeness and condition of the tool.

Inspection should include:

- Visual inspection of the outer parts of the tool, checking for obvious damage, degradation or missing parts.

Cleaning and servicing should be undertaken as required prior to the tool being used, stored or transported.

8.1.2 FA1TMSTD (ATM2) Cleaning

To lightly clean the tool, wipe gently with a damp cloth.

If more thorough cleaning is required (for example following immersion in water) carry out the following cleaning procedure:

- Strip the tool down, observing the schematics in section 9.
- Clean the components using detergent, following the manufacturer's guidelines
- Rinse the components to remove traces of detergent
- Dry the component thoroughly

Inspect, service and lubricate the tool immediately after the cleaning process.

8.1.3 FA1TMSTD (ATM2) Servicing

Replace missing, worn or damaged parts. Use only genuine Equalizer parts from approved distributors or service centres. Equalizer parts have been engineered and manufactured to be fit for purpose.

Grease all moving parts by following the Lubrication Procedure prior to usage, storage or transportation.

Ensure wedges, pins and legs remain grit free and that parts move freely.

Secure the tool upright on a bench.

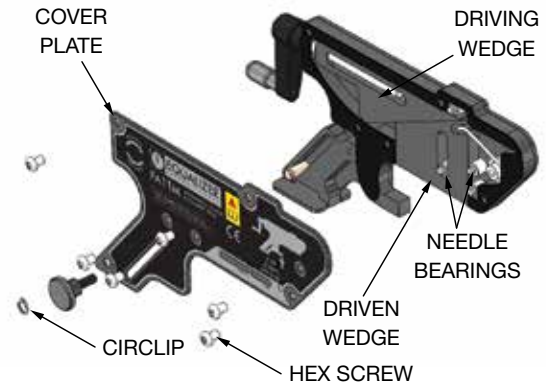
Using a small flat screwdriver, lever out one circlip and unscrew 6 x 6mm hex screws.

Remove cover plate and remove any dirt or corrosion from moving parts.

Inspect components for wear and damage, replace if necessary! If there's no damage present, then they can be greased and re-assembled by reversing the previous steps.

Recommended grease:

- Rocol Sapphire Hi-Load or equivalent good quality Hi-Load bearing grease.



8.2 FA4TMSTD (ATM4) Maintenance

8.2.1 FA4TMSTD (ATM4) Inspection

A thorough inspection should be carried out prior to usage, storage or transportation to ensure the completeness and condition of the tool.

Inspection should include:

- Visual inspection of the outer parts of the tool, checking for obvious damage, degradation or missing parts.

Cleaning and servicing should be undertaken as required prior to the tool being used, stored or transported.

8.2.2 FA4TMSTD (ATM4) Cleaning

To lightly clean the tool, wipe gently with a damp cloth.

If more thorough cleaning is required (for example following immersion in water) carry out the following cleaning procedure:

- Strip the tool down, observing the schematics in section 9
- Clean the components using detergent, following the manufacturer's guidelines
- Rinse the components to remove traces of detergent
- Dry the component thoroughly

Inspect, service and lubricate the tool immediately after the cleaning process.

8.2.3 FA4TMSTD (ATM4) Servicing

Replace missing, worn or damaged parts. Use only genuine Equalizer parts from approved distributors or service centres. Equalizer parts have been engineered and manufactured to be fit for purpose.

Grease all moving parts by following the Lubrication Procedure prior to usage, storage or transportation.

Ensure rollers, pins and wing remain grit free and that the rollers rotate freely.

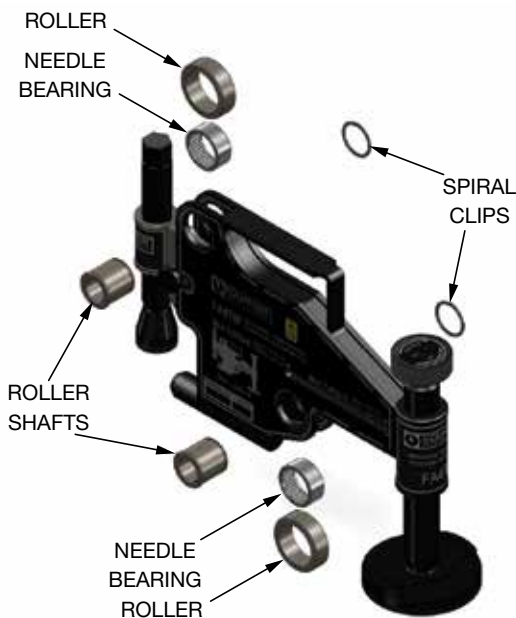
Secure the tool upright on a bench.

Using a small flat screw driver, lever out the end of the spiral clips and then rotate anti-clockwise and remove.

Slide the roller shafts out in order to remove the rollers and bearings for examination.

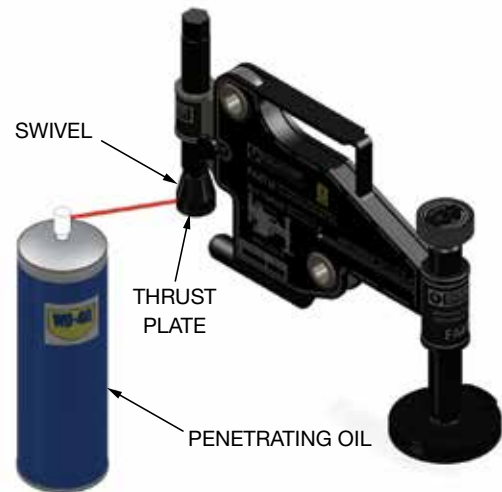
Inspect the roller shafts, rollers and bearings for damage. If there is no damage present then they can be cleaned, greased and re-assembled by reversing the steps above.

Recommended grease: Hi-load bearing grease, e.g. Rocol Sapphire hi-load.



It is important that the thrust bearing is free from dirt and corrosion and rotates freely.

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 below.



Ensure the thrust plates rotate freely before using the tool to align a flange joint.



8.3 FA9TESTD (ATM9) Maintenance

8.3.1 Inspection

A thorough inspection should be carried out prior to usage, storage or transportation to ensure the completeness and condition of the tool.

Inspection should include:

- Visual inspection of the outer parts of the tool, checking for obvious damage, degradation or missing parts.

Cleaning and servicing should be undertaken as required prior to the tool being used, stored or transported.

8.3.2 Cleaning

To lightly clean the tool, wipe gently with a damp cloth.

If more thorough cleaning is required (for example following immersion in water) carry out the following cleaning procedure:

- Strip the tool down, observing the schematics in section 9
- Clean the components using detergent, following the manufacturer's guidelines
- Rinse the components to remove traces of detergent
- Dry the component thoroughly

Inspect, service and lubricate the tool immediately after the cleaning process.

8.3.3 Servicing

Replace missing, worn or damaged parts. Use only genuine Equalizer parts from approved distributors or service centres. Equalizer parts have been engineered and manufactured to be fit for purpose.

Grease all moving parts by following the Lubrication Procedure prior to usage, storage or transportation.

Ensure rollers, pins and wing remain grit free and that the rollers rotate freely.

Place the tool on a workbench and secure it in an upright position.

Remove the two spring pins on the front of the main body as shown.



The wing can now be removed from the main body by sliding it forward.



Remove the circlip using circlip pliers (not illustrated).



Remove the shaft and two bearings.

Inspect the bearing housing, shaft and needle bearings for any sign of damage, dirt or grit. Clean the surfaces before applying grease to the shaft and into the needle bearings.

Recommended grease - Rocol or Sapphire Hi-Load.



Remove the spiral retaining clips from the lower shaft and slide the shaft out from the main body.

The roller and needle bearing can be removed through the upper section of the tool as shown.

Inspect the roller, shaft and needle bearings for any sign of damage, dirt or grit. Clean and then smear a small amount of grease onto the shaft and into the needle bearings.

Recommended grease - Rocol Sapphire Hi-Load or equivalent Hi-Load Bearing grease.

Re-assemble by reversing the steps above.

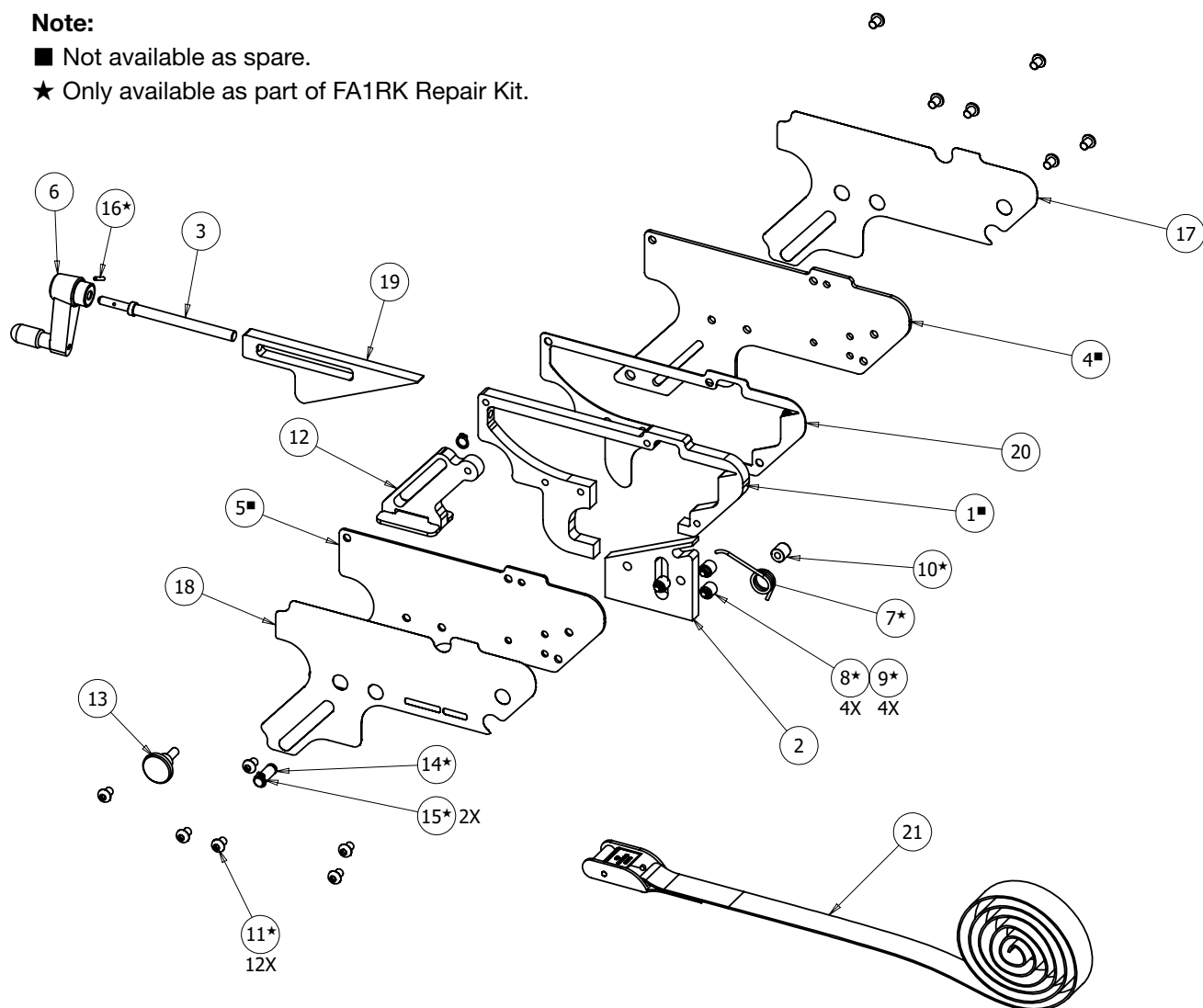
9. Parts List

9.1 Exploded Views - FA1TMSTD (ATM2)

Note:

■ Not available as spare.

★ Only available as part of FA1RK Repair Kit.



9.2 Table of Parts - FA1TMSTD (ATM2)

Item	Description	Qty	Part Numbers
1	Body Frame (Machined)	1	■
2	Driven Wedge	1	210300-01
3	Drive Screw Assy.	1	210400-01
4	Base Plate (3mm)	1	■
5	Cover Plate (2mm)	1	■
6	Crank Handle	1	210600-01
7	Torsion Spring	1	★
8	Needle Bearing	4	★
9	Bearing Shaft	4	★
10	Spring Mandrel	1	★
11	M6x8 GR10.9 SCKT FL.BT.Screw	12	★
12	Drop Leg AS.	1	211800-01
13	M6 Release Knob	1	230203-01
14	Leg Pin 8mm	1	★
15	Spring Ring 8mm	2	★
16	Carbon Steel Spring Pin 2x16mm	1	★
17	Body Sticker Equalizer (Left)	1	070280-01
	Body Sticker Enerpac (Left)	1	EN070280-01
18	Body Sticker Equalizer (Right)	1	070281-01
	Body Sticker Enerpac (Right)	1	EN070281-01
19	Driving Wedge (Machined)	1	210100-01
20	Spacer Shim	1	211600-01
21	800kg Mini Ratchet Strap	1	220800-01

Note:

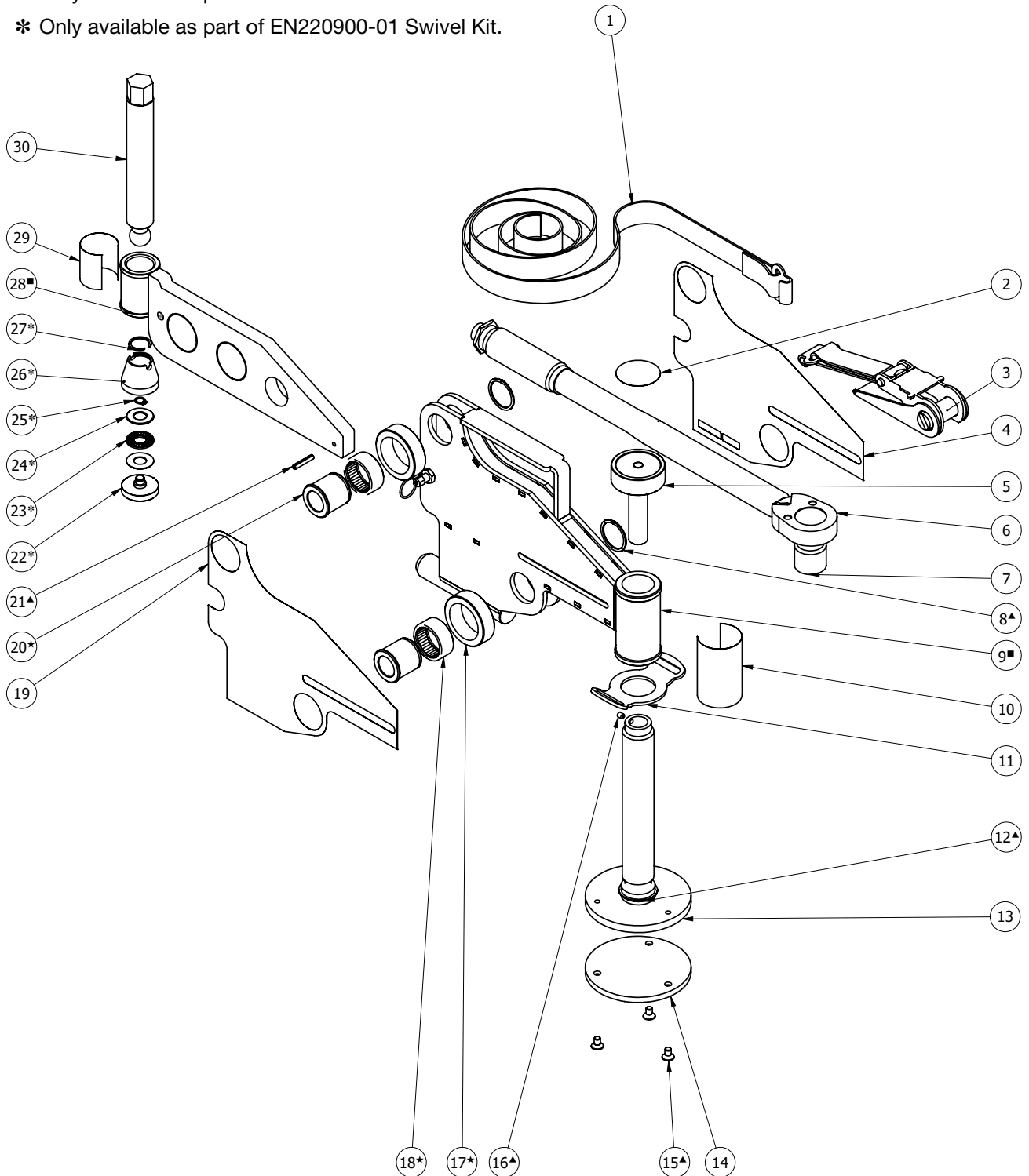
■ Not available as spare.

★ Only available as part of FA1RK Repair Kit.

9.3 Exploded Views - FA4TMSTD (ATM4)

Note:

- Not available as spare.
- ★ Only available as part of FA4BK Bearing Kit.
- ▲ Only available as part of FA4FK Fastner Kit.
- * Only available as part of EN220900-01 Swivel Kit.



9.4 Table of Parts - FA4TMSTD (ATM4)

Item	Description	Qty	Part Numbers
1	Ratchet Strap	1	400280-01
2	Drop Leg Knob Sticker	1	070273-01
3	Ratchet	1	400270-01
4	Body Plate Sticker Equalizer (Left)	1	070270-01
	Body Plate Sticker Enerpac (Left)	1	EN070270-01
5	Leg Screw Extension	1	220700-01
6	Torque Wrench	1	400203-01
7	22 mm Socket	1	400204-01
8	Spirol Clip	1	▲
9	Main Body	1	■
10	Enerpac Logo For Boss	1	EN070272-01
	Equalizer Logo For Boss		070272-01
11	Buckle	1	230802-01
12	Spirol Clip	1	▲
13	Leg Screw	1	220600-01
14	Round Base Pad Profile	1	230803-09
15	CTRS Screw M6X10	3	▲
16	M5 SCKT Set Screw	1	▲
17	Outer Roller	2	★
18	Needle Bearing	2	★
19	Body Plate Sticker Equalizer (Right)	1	070271-01
	Body Plate Sticker Enerpac (Right)	1	EN070271-01
20	Roller Shaft	2	★
21	Roller Pin	1	▲
22	Friction Pad	1	*
23	Thrust Race	1	*
24	Thrust Washer	2	*
25	Spring Ring 8mm	1	*
26	Swivel	1	*
27	Spring Clip	1	*
28	Sliding Arm Ass	1	■
29	Logo for Wing Equalizer	1	070004-01
	Logo for Wing Enerpac	1	EN070004-01
30	Screw Bolt	1	400301-01

Note:

■ Not available as spare.

★ Only available as part of FA4BK Bearing Kit.

▲ Only available as part of FA4FK Fastener Kit.

* Only available as part of EN220900-01 Swivel Kit.

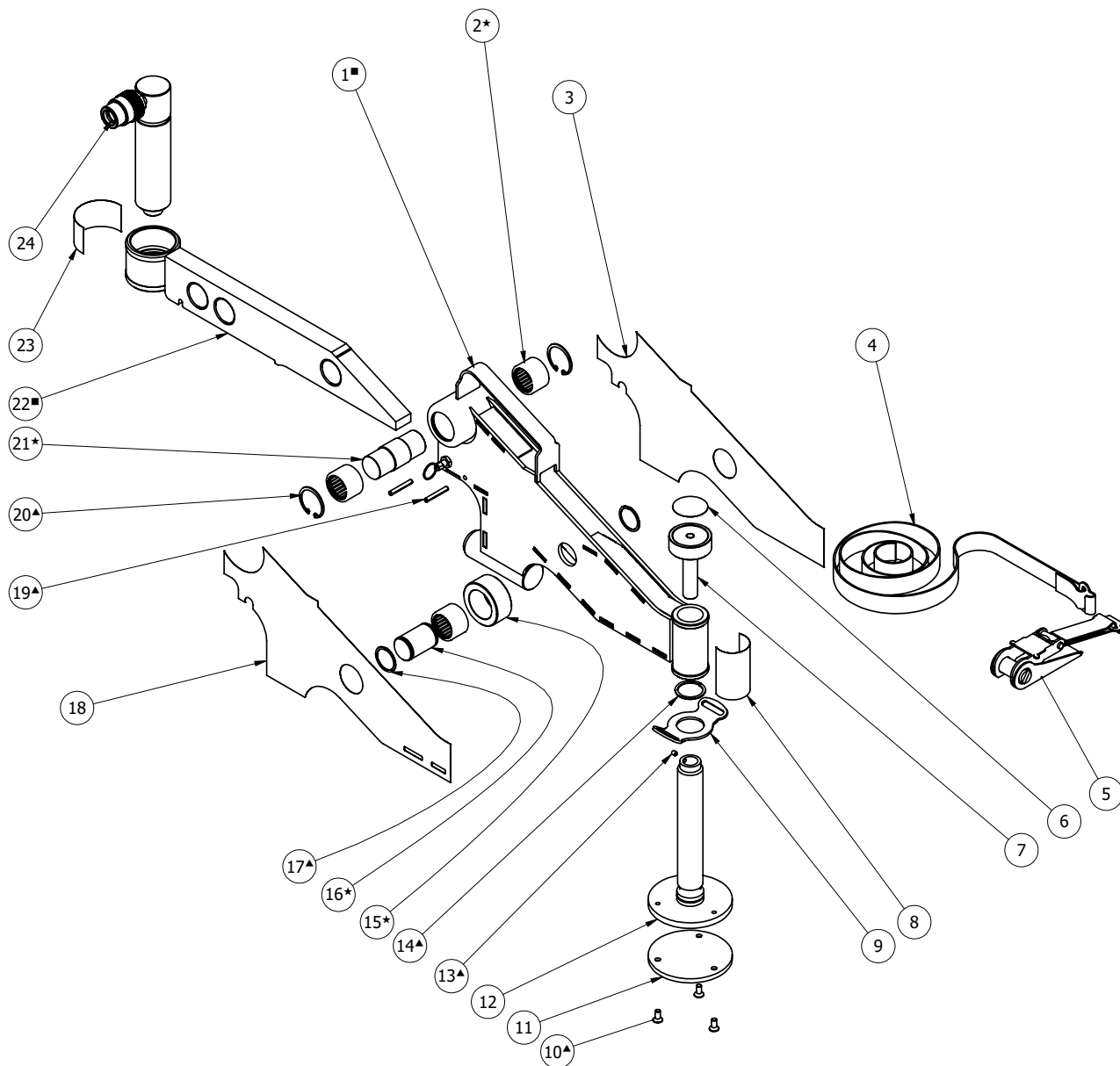
9.5 Exploded Views - FA9TESTD (ATM9)

Note:

■ Not available as spare.

★ Only available as part of FA9BK Bearing Kit.

▲ Only available as part of FA9FK Fastener Kit.



9.6 Table of Parts - FA9TESTD (ATM9)

Item	Description	Qty	Part Numbers
1	Main Body	1	■
2	Needle Bearing	3	★
3	Body Plate Sticker Equalizer (Left)	1	070276-01
	Body Plate Sticker Enerpac (Left)	1	EN070276-01
4	Ratchet Strap	1	400280-01
5	Ratchet	1	400270-01
6	Drop Leg Knob Sticker	1	070273-01
7	Leg Screw Extension	1	220700-01
8	Logo for Boss Equalizer	1	070278-01
	Logo for Boss Enerpac	1	EN070278-01
9	Buckle	1	230802-01
10	CTRS Screw M6x14	3	▲
11	Round Base Pad Profile	1	230803-09
12	Leg Screw	1	220600-01
13	M5 SCKT Set Screw	1	▲
14	Spirol Clip	1	▲
15	Rear Roller	1	★
16	Rear Roller Pin	1	★
17	Spirol Clip	2	▲
18	Body Plate Sticker Equalizer (Right)	1	070277-01
	Body Plate Sticker Enerpac (Right)	1	EN070277-01
19	Spring Pin 5x36	2	▲
20	Circlip O/D 40	2	▲
21	Front Roller Pin	1	★
22	Wing Arm (Weldment)	1	■
23	Logo for Wing Equalizer	1	070233-01
	Logo for Wing Enerpac	1	EN070233-01
24	Equalizer 6T H. Cylinder (PR601UK)	1	903101-01
	Enerpac 6T H. Cylinder (CR400)	1	EN903101-01

Note:

■ Not available as spare.

★ Only available as part of FA9BK Bearing Kit.

▲ Only available as part of FA9FK Fastener Kit.

10. Troubleshooting

10.1 Troubleshooting - FA1TMSTD (ATM2)

Fault	Possible Cause	Corrective Action
The tool is attached and appears to be functioning properly but the joint will not align.	There may be something restricting the joint from aligning.	Check the area around the joint to establish if there is an obstruction to the joint.
	The joint may require more than 1 T [10 kN] force to align.	If the joint requires more force than that of the 1 T [10 kN] tool, attach a second tool or another method of aligning should be adapted.

10.2 Troubleshooting - FA4TMSTD (ATM4)

Fault	Possible Cause	Corrective Action
The thrust plate is sliding along the circumference of the opposite flange as the tool is aligning the joint.	Grit or dirt on wing, rollers or bearings.	Ensure the rollers are rotating freely and that there is no restrictions to the rollers on the wing surfaces such as grit or dirt.
	Wing is at full extension.	Ensure the wing has sufficient travel left in order to allow the joint to align.
The tool is attached and appears to be functioning properly, but the joint will not align.	There may be something restricting the joint from aligning.	Check the area around the joint to establish if there is an obstruction to the joint.
	The joint may require more than 4 T [40 kN] force to align.	If the joint requires more force than that of the 4 T [40 kN] tool, then another method of alignment should be adopted.
The thrust plate is twisting on the circumference of the flange when the screw bolt is tightened.	There may be grit or dirt within the swivel / thrust plate.	Check that the thrust plate rotates freely. If the thrust plate is not rotating then spray some penetrating liquid into the gap between the swivel and thrust plate in order to loosen it.

10.3 Troubleshooting - FA9TESTD (ATM9)

Fault	Possible Cause	Corrective Action
The tool is advancing but does not reach full pressure.	Air could be present in the hydraulic system.	Use the airlock removal procedure as follows

10.3.1 Airlock Removal Procedure

Connect the hand pump to the tool with the hydraulic hose.

Close the release valve on the pump and prime the pump until the hydraulic cylinder is fully extended and a small pressure is achieved.

With the hand pump held above the tool in an upright position, open the release valve. Any air that is within the system will be forced up through the pump and vented into the oil reservoir.

Repeat the above steps three or four times to ensure that all air is removed from the system and the tool will reach full working pressure.

Disconnect the hand pump from the hydraulic hose, grip the baseplate of the hand pump body in a vice with the pump body vertical and the main handle at the top.

Remove the four nuts holding the main handle and lift off.

Grip the refilling plug with pliers and extract it by pulling and twisting simultaneously. Ensure the reservoir body is held down when removing the refilling plug as pulling up on the reservoir body will release the bladder within, and oil will spill out.

Fill the reservoir to the top with a good quality hydraulic oil of the grade 15 cSt.

Reinsert the refilling plug, wipe away any oil and reassemble by reversing the disassembly process.

