

WHERE THERE IS PIPE, THERE'S MATHEY

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SUPER CLAMP (Rigid Clamp) PARTS & OPERATING MANUAL

Part Number: SC-RC-0612HD THRU SC-RC-3036HD



For future reference, record your Super	Clamp model and serial numbers here:
Super Clamp Model	Serial #

Revision Level: IR

Date: November 10, 2016

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1.0 Safety

1.1 General Awareness

ALL WARNINGS PROVIDED IN THIS MANUAL MUST BE READ AND ALL PROCEDURES FOLLOWED IN AN EFFORT TO PREVENT INJURY OR DEATH TO PERSONNEL AND / OR DAMAGE TO THE EQUIPMENT.

ONLY QUALIFIED AUTHORIZED PERSONNEL should operate Mathey Dearman equipment. This manual includes safety instructions throughout the operation instructions as well as those noted on this Safety Instruction page. Throughout this manual these warnings will be noted by theses warning symbols.



Operation of this equipment should be in accordance with the instructions provided in this manual. No Mathey Dearman equipment should ever be used in a manner other than as described in this manual.

Operators should wear approved PPE at all times while using this equipment. PPE includes hard hat, ANSI approved eye protection, gloves, steel toe boots and protective clothing. Do not wear loose clothing that can become entangled in the equipment.





WARNING: The Mathey Dearman Super Clamp is designed <u>only</u> for light reforming and accurate alignment operations. <u>IT IS NOT INTENDED FOR MATERIAL HANDLING</u> **PURPOSES.** Always exercise extreme caution when using the Super Clamp.

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- IN ADDITION TO THE ABOVE WARNINGS ALL NATIONAL AND INTERNATIONAL SAFETY RULES FOR THE USE OF THE SUPER CLAMP MUST BE FOLLOWED TO PREVENT ANY INJURIES OR DEATH AS A RESULT OF IMPROPER CLAMPING PROCEDURES.
- TO REDUCE THE RISK OF SERIOUS OR INJURY DEATH THE SUPER CLAMP SHOULD NEVER BE USED TO LIFT PIPE UNDER ANY CIRCUMSTANCES. The pipe must have an external source of support at all times when the Super Clamp is being installed and during use.
- ONLY QUALIFIED, TRAINED AND AUTHORIZED PERSONNEL should operate the Super Clamp. Other personnel should NOT be allowed to set-up, operate or maintain the Super Clamp.
- When using the Super Clamp, basic safety precautions must always be followed to reduce the risk of personal injury.
- The Super Clamp should be inspected for defects such as cracks, nicks, arc marks, and abrasions prior to use and during scheduled maintenance.
- Maintenance personnel must read and understand the parts and operating manual of the Super Clamp prior to attempting maintenance on the clamp.
- The operator should insure that the area around the Super Clamp is clear of debris and other hazards that may pose a trip hazard to personnel during operation.
- To avoid the risk of electrical shock the operator must insure that the Super Clamp is within a safe distance from power lines or other electrical sources.
- Never use the Super Clamp as a ground for any purpose.
- Make sure loose clothing, tools, belts, etc. do not become entangled in the Super Clamp.
- The periodic maintenance instructions must be followed in the Super Clamp parts and operating manual to avoid serious injury.
- The pipe must be secured from rotation, prior to mounting the Super Clamp on the pipe.
- Never use the Super Clamp for any operation other than its intended purpose.
- The aligning and reforming capabilities of each Super Clamp depends on pipe diameter, pipe wall thickness, and tensile strength of the pipes the clamp is used on. If in doubt with regards to the specific capabilities, contact Mathey Dearman Inc. at (918) 447-1288.

1.2 General Safety Precautions

ELECTRIC SHOCK CAN KILL

Electric Shock can injure or kill. Saddle machine operation and many cutting processes use or produce high voltage electrical energy. This electric energy can cause severe or fatal shock to the operator or others in the work place.

- Never touch any parts that are electrically "live" or "hot" •
- Wear dry gloves and clothing. Insulate yourself from the work piece or other parts of the plasma cutting circuit.
- Repair or replace all worn or damaged parts.
- Extra care must be taken when work place is moist or damp. •
- If installing a motorized saddle machine, install and maintain equipment according to NEC (National Electric Code), . refer to publications section in this manual.
- Disconnect power source before performing any service or repairs.
- Read and follow all the instructions in the operating manuals.



FIRE AND EXPLOSION

Hot slag, sparks, oxygen-fueled cutting flame or the plasma arc can cause fire and explosion.

- Be sure there are no combustible or flammable materials in the workplace. Any material that cannot be removed must be protected.
- Ventilate all flammable or explosive vapors from the workplace.
- Do not cut or weld on containers that may have held combustibles.
- Provide a fire watch when working in an area where fire hazards may exist.



Noise can cause permanent hearing loss. Plasma arc cutting, oxy/fuel torch cutting, and grinding can cause noise levels that exceed safe limits. You must protect your ears from loud noise to prevent permanent loss of hearing.

- To protect your hearing from loud noise, wear protective earplugs and/or ear muffs. Protect others in the workplace.
- Noise levels should be measured to be sure the decibels (sound) do not exceed safe levels.
- For information on how to test for noise refer to the publications section of this manual



🚨 GASES, DUST, AND FUMES

Gases and fumes produced during the cutting process can be dangerous to your health.

- Keep all fumes and gases away from the breathing area. Keep your head out of the cutting fume plume.
- Use an air-supplied respirator if ventilation is not adequate to remove all fumes and gases.
- The kinds of fumes and gases from cutting depend on the kind of metal being cut, coatings on the metal, and the different processes. You must be very careful when cutting or welding any metals which may contain the following:

	1	5		8
Antimony	Cadmium	Lead	Selenium	Arsenic
Chromium	Manganese	Silver	Barium	Cobalt
Mercury	Vanadium	Beryllium	Copper	Nickel

Always read the Material Safety Data Sheet (MSDS) supplied with the material you are cutting. The MSDS will give you the information regarding the kind and amount of fumes and gases that may be produced from cutting and those that may be dangerous to your health

- For information on how to test for fumes and gases in your workplace refer to publications section of this manual.
- Use special equipment, if needed, to capture fumes and gases.
- Do not use in an area where combustible or explosive gases or materials are located.
- Phosgene, a toxic gas, is generated from the vapors of chlorinated solvents and cleansers. Remove all sources of these vapors.
- This product, when used for welding or cutting, produces fumes or gases which contain chemicals known to the State of California to cause birth defects and, in some cases, cancer. (California Health & Safety Code Sec. 25249.5 et seq.)
- Some dust created by cutting, grinding, drilling, and other construction activities contains chemicals known to cause cancer, birth defects or other reproductive harm. Some examples of these chemicals are:
 - o Lead from lead-based paint.
 - o Crystalline silica from bricks and cement and other masonry products.
 - Arsenic and chromium from chemically-treated lumber (CCA).

- Your risk from these exposures varies, depending on how often you do this type of work. To reduce your exposure to these chemicals: work in a well-ventilated area, and work with approved safety equipment, such as those dust masks that are specially designed to filter out microscopic particles.
- Avoid prolonged contact with dust from cutting, grinding, drilling, and other construction activities. Wear protective clothing and wash exposed areas with soap and water. Allowing dust to get into your mouth, eyes, or lay on the skin may promote absorption of harmful chemicals.

FLYING DEBRIS

Metal cutting operations can create debris. Use proper eye protection pursuant to ANSI Z87.1 requirements. All persons operating in the vicinity of Saddle Machine operations should be aware of debris and take necessary precautions. Consult the publications section of this manual for further information.



PLASMA ARC RAYS

Plasma Arc Rays can injure your eyes and burn your skin. The plasma arc process produces very bright ultraviolet and infrared light. These arc rays will damage your eyes and burn your skin if you are not properly protected.

- To protect your eyes, always wear a welding helmet or shield. Also, always wear safety glasses with side shields, goggles or other protective eye wear.
- Wear welding gloves and suitable clothing to protect your skin from the arc rays and sparks.
- Keep helmet and safety glasses in good condition. Replace lenses when cracked, chipped or dirty.
- Protect others in the work area from the arc rays. Use protective booths, screens or shields.
- Use the shade of lens as suggested in the following per ANSI/ASC Z49.1:

A HEAVY COMPONENTS

Use caution when lifting or moving the saddle machine. Use team lifting when necessary to avoid personal injury. When using a mechanical device to move a machine follow all manufacturers' safety guidelines. Pipe being operated on with the machine may be heavy. Use all lifting guidelines outlined in Occupational Safety & Health Administration technical manual Sect. 7, Ch. 1.5. See publications section for additional information.

LECTRIC AND MAGNETIC FIELDS

Electric current flowing through any conductor causes localized Electric and Magnetic Fields (EMF). Welding and plasma cutting current creates EMF fields around cables and machines. EMF fields may interfere with some pacemakers, and operators and observers having a pacemaker should consult their physician before operation. Exposure to EMF fields may also have other health effects which are now not known.

PINCH AND CRUSH POINTS

Mathey Dearman Saddle Machines in motion can create pinch points in normal operation. Be aware of all areas that may potentially be a hazard when the Saddle Machine is in motion. Avoid working on the machine while the control electronics are energized. Do not allow hoses, cords or other nearby items to come in contact with the machine.



The process of plasma cutting creates an arc of electricity that can be up to 45,000°F (25,000°C). Oxygen-fuel cutting flame can be up to 6,330°F (3,500°C). As a result, cut materials will be very hot after cutting. Use extreme care when handling recently cut materials. Proper protective apparel such as protective gloves should be worn when handling recently cut material. Material handling devices should also be considered. It is recommended to allow material to cool completely before handling.



Certain tools and equipment use compressed air lines to operate. These air lines are under pressure. Hot sparks or flying debris may cause damage to these lines. Ensure that the air lines are kept free of punctures, burns, or other damage or defects that could cause failure. Inspect air lines periodically and repair or replace damaged lines.

1.3 Reference Publications (additional safety precautions & measures)

In addition to the safety precautions and measures listed in 1.1 and 1.2, refer to the following safety standards or their latest revisions for more information:

• OSHA, SAFETY AND HEALTH STANDARDS, 29CFR 1910, obtainable from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402

• ANSI Standard Z49.1, SAFETY IN WELDING AND CUTTING, obtainable from the American Welding Society, 550 N.W. Lejeune Rd, Miami, FL 33126

• NIOSH, SAFETY AND HEALTH IN ARC WELDING AND GAS WELDING AND CUTTING, obtainable from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402

• ANSI Standard Z87.1, SAFE PRACTICES FOR OCCUPATION AND EDUCATIONAL EYE AND FACE PROTECTION, obtainable from American National Standards Institute, 1430 Broadway, New York, NY 10018

• ANSI Standard Z49.2, FIRE PREVENTION IN THE USE OF CUTTING AND WELDING PROCESSES, obtainable from American National Standards Institute, 1430 Broadway, New York, NY 10018

• AWS Standard A6.0, WELDING AND CUTTING CONTAINERS WHICH HAVE HELD COMBUSTIBLES, obtainable from American Welding Society, 550 N.W. Lejeune Rd, Miami, FL 33126

• NFPA Standard 51, OXYGEN-FUEL GAS SYSTEMS FOR WELDING, CUTTING AND ALLIED PROCESSES, obtainable from the National Fire Protection Association, Batterymarch Park, Quincy, MA 02269

• NFPA Standard 70, NATIONAL ELECTRICAL CODE, obtainable from the National Fire Protection Association, Batterymarch Park, Quincy, MA 02269

• NFPA Standard 51B, CUTTING AND WELDING PROCESSES, obtainable from the National Fire Protection Association, Batterymarch Park, Quincy, MA 02269

• CGA Pamphlet P-1, SAFE HANDLING OF COMPRESSED GASES IN CYLINDERS, obtainable from the Compressed Gas Association, 1235 Jefferson Davis Highway, Suite 501, Arlington, VA 22202

• CSA Standard W117.2, CODE FOR SAFETY IN WELDING AND CUTTING, obtainable from the Canadian Standards Association, Standards Sales, 178 Rexdale Boulevard, Rexdale, Ontario, Canada M9W 1R3

• NWSA booklet, WELDING SAFETY BIBLIOGRAPHY obtainable from the National Welding Supply Association, 1900 Arch Street, Philadelphia, PA 19103

• ANSI Standard Z88.2, PRACTICE FOR RESPIRATORY PROTECTION, obtainable from American National Standards Institute, 1430 Broadway, New York, NY 10018

2.0 Warranty

WARRANTY INFORMATION

3.0 General Description

The Mathey Dearman Super Clamp is engineered to align and reform two ends of pipe for welding. Each clamp covers a specific 6" diameter range of pipe, as noted in Table 1.

Model	Total Assembly Weight Ibs / Kg	Weight of each ring half assembly lbs / Kg	Operating Pipe Diameter Range Inches / mm
SC-RC-0612HD	130 / 59	46 / 21	6-12 / 152.4-304.8
SC-RC-1218HD	165 / 75	64 / 29	12-18 / 304.8-457.2
SC-RC-1824HD	195 / 88	79 / 36	18-24 / 457.2-609.6
SC-RC-2430HD	230 / 104	96 / 44	24-30 / 609.6-762.0
SC-RC-3036HD	255 / 116	108 / 49	30-36 / 762.0-914.4

Table 1: Weight & Applicable pipe size ranges for each Super Clamp Model

The operating footprint is illustrated below in Figure 1.



Figure 1: Operating footprint of a Super Clamp

3.1 Capabilities and Limitations

In addition to each pipe diameter range, each Mathey Dearman Super Clamp has limitations to the schedule of size and schedule of pipe it can align and reform. Each super clamp is able to align up to schedule 80 of pipe (provided the pipe is within the operating range of the super clamp, as listed above in Table 1.) Table 2 lists the reforming capabilities of each super clamp for a given pipe diameter and schedule. *Note: Reforming is only capable when using the universal jackbars, which will be discussed later in 4.4.8.*

Super Clamp	Pipe OD	Able to cond	o reform u dition, for	up to a 1/: the given	round dule	Able to reform up to a 1/8" out of round condition, for the given pipe schedule					
	(inches)	10	20	30	40	STD	10	20	30	40	STD
Super Clamp SC-RC-0612HD SC-RC-1218HD SC-RC-1824HD SC-RC-1824HD	6	NO	na	na	NO	NO	NO	na	na	NO	NO
	8	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO
	10	YES	YES	NO	NO	NO	NO	NO	NO	NO	NO
	12	YES	YES	YES	YES	YES	YES	NO	NO	NO	NO
	12	YES	YES	NO	NO	NO	NO	NO	NO	NO	NO
SC-RC-1218HD	14	YES	YES	YES	NO	YES	NO	NO	NO	NO	NO
	16	YES	YES	YES	NO	YES	YES	NO	NO	NO	NO
	18	YES	YES	YES	YES	YES	YES	YES	NO	NO	NO
	18	YES	YES	YES	NO	YES	NO	NO	NO	NO	NO
	20	YES	YES	YES	NO	YES	YES	NO	NO	NO	NO
3C-RC-102411D	22	YES	YES	YES	na	YES	YES	NO	NO	na	NO
	24	YES	YES	YES	YES	YES	YES	YES	NO	NO	YES
	24	YES	YES	YES	NO	YES	YES	NO	NO	NO	NO
	26	YES	YES	na	na	YES	YES	NO	na	na	YES
3C-RC-243011D	28	YES	YES	YES	na	YES	YES	NO	NO	na	YES
	30	YES	YES	YES	na	YES	YES	YES	NO	na	YES
	30	YES	YES	YES	na	YES	YES	NO	NO	na	YES
	32	YES	YES	YES	YES	YES	YES	NO	NO	NO	YES
3C-RC-3030HD	34	YES	YES	YES	YES	YES	YES	YES	NO	NO	YES
SC-RC-1824HD SC-RC-2430HD SC-RC-3036HD	36	YES	YES	YES	YES	YES	YES	YES	NO	NO	YES

The max gap (between two pipes) that the Super Clamp can adjust is 1.25". Table 3 lists the max hi-lo conditions for each pipe size range on any Super Clamp.

Table 3: Max Hi-Lo condition	(inches) f	for each Su	per Clamp	model
	(

	Max Hi-Lo (inches)					
Pipe Diameter	Using universal jackbars for hi-lo adjustment	Not using universal jackbars for hi-lo adjustment				
Max size (i.e. 12" pipe on SC-RC-0612)	1.000	0.750				
Max size – 2"	1.000	0.750				
Max size – 4"	0.875	0.625				
Min size (i.e. 6" pipe on SC-RC-0612)	0.500	0.250				

The operator or maintenance personnel should fully understand the instructions contained in this manual to safely operate and maintain the Mathey Dearman Super Clamp. If you have any questions about setup and operation of the Super Clamp or about an application the clamp is desired to perform, contact Mathey Dearman at 918-447-1288.

3.2 Components and Nomenclature

Figure 2 and Table 4 diagram the basic components of the Super Clamp and their respective quantities for each model.



Figure 2: Super Clamp component diagram

Table 4: Super	Clamp components	and quantities pe	r model assembly

	Ring Half Assemt (Item 1)	Jackscrew (Item 2)		Turnbuckle Asser (Item 3)	Quick Release Pins (Item 4)			
Clamp Model	Part Number	Qty	Part Number	Qty	Part Number	Qty	Part Number	Qty
SC-RC-0612HD	SC-RC-0612HD-RH	2	DC-501E	12	SC-RC-005	4	SC-RC-009	10
SC-RC-1218HD	SC-RC-1218HD-RH	2	DC-501E	20	SC-RC-005	4	SC-RC-009	10
SC-RC-1824HD	SC-RC-1824HD-RH	2	DC-501E	28	SC-RC-005	4	SC-RC-009	10
SC-RC-2430HD	SC-RC-2430HD-RH	2	DC-501E	36	SC-RC-005	4	SC-RC-009	10
SC-RC-3036HD	SC-RC-3036HD-RH	2	DC-501E	36	SC-RC-005	4	SC-RC-009	10

Each SC-RC-005 turnbuckle is comprised of three components, as shown below in Figure 3.



Figure 3: SC-RC-005 turnbuckle assembly

In addition to the main assembly, each Super Clamps comes with four (4) DC-820 universal jackbars and eight (8) DC-501E extended jackscrews. These components are used to make hi-lo adjustments. They are illustrated below in Figure 4.



Figure 4: Universal jackbars and additional jackscrews that come with the assembly

Finally, each Super Clamp assemblies come with the following:

Clamp Madal	18" breaker with ½" dri	bar ive	¾" socket with ½" drive		Extended Turnbuckle Body		½" dia x 3.25" cap screw		Locknut	
	Part	Otv	Part Part	Part	0.1	Part	0+1	Part	Otv	
	Number	Qty	Number		Number		Number	Qly	Number	QLY
SC-RC-0612HD	D900-005	1	DWR-300	1	SC-RC-016	4	11.12C0.314	0	1L.12C0.000	0
SC-RC-1218HD	D900-005	1	DWR-300	1	SC-RC-016	4	11.12C0.314	4	1L.12C0.000	4
SC-RC-1824HD	D900-005	2	DWR-300	2	SC-RC-016	4	11.12C0.314	4	1L.12C0.000	4
SC-RC-2430HD	D900-005	2	DWR-300	2	SC-RC-016	4	11.12C0.314	4	1L.12C0.000	4
SC-RC-3036HD	D900-005	2	DWR-300	2	SC-RC-016	4	11.12C0.314	4	1L.12C0.000	4

Table 5: Operational tools and accessories

The breaker bar(s) and socket drive(s) are used to adjust the jackscrews.

The extended turnbuckles, pictured below in Figure 5, replace the SC-RC-004 body for operations in which the operator would like to place a heating coil / element in between the ring halves of the Super Clamp during operation. This process is described in more detail in 4.6.



Figure 5: SC-RC-016 extended turnbuckle body

The cap screws and nuts are included to assist in lifting and opening the heavier Super Clamps. This process is described in more detail in 4.1.1. <u>When lifting / opening the heavier Super</u> <u>Clamps, use an approved¹ double leg lifting chain.</u>

¹ Approved by the operator's safety team / representative. Hooks which attach to the Super Clamp should not be more than 1" thick.

4.0 Operation

4.1 Unpacking

The super clamp will be packed with the two ring half assemblies and the four turnbuckle assemblies separate from each other (as illustrated in the right hand side of Figure 2).

4.1.1 Unpack each Super Clamp ring half assembly individually from the container and place on the floor or a secure platform.



WARNING: Use a team lifting method or an approved double leg lifting chain to remove the ring half assemblies from the box, as lifting otherwise could cause serious injury.

For the larger Super Clamp models (SC-RC-1218HD and above), the included cap screws and nuts should be installed as shown below in Figure 6 to provide lifting points for each ring half assembly. The weight of each ring half is listed in Table 1.



Figure 6: Installation of cap screws and nuts to provide lifting points

Note: Be sure to install the cap screws and nuts at the Top of the Super Clamp (as shown)



WARNING: Keep extremities away from the bottom of the Super Clamp, as (if allowed to open while lifting) it can cause serious injury when it closes.

These bolts and screws can remain in each ring half assembly until it has been placed on the pipe per 4.2.6.

4.1.2 Unpack the remaining components.

4.2 Lifting / Installation on the pipe



WARNING: Follow steps 4.2.1 through 4.2.7 for each ring half assembly individually. **DO NOT ATTEMPT TO FULLY ASSEMBLED SUPER CLAMP AND LIFT / INSTALL ON PIPE.** Attempting to do so can result in severe damage to the product, the pipe, and serious injury and / or death.

4.2.1 Note the bore diameter of each ring half assembly, as listed in Table 6.

Model	Bore Diameter (inches)
SC-RC-0612HD	14
SC-RC-1218HD	20
SC-RC-1824HD	26
SC-RC-2430HD	32
SC-RC-3036HD	38

Table 6: Super Clamp bore diameters

4.2.2 Determine the outside diameter of the pipes or tubes to be aligned. *Note: Given* manufacturing tolerances and out of round / hi-lo conditions, the pipes need to be of equal size for the Super Clamp to work properly.



WARNING: Verify the pipes or tubes are properly supported before gathering measurements. If not properly supported, there is serious risk of severe injury or death.

4.2.3 Subtract the pipe outside diameter from the clamp bore and divide the difference by 2. **Example: SC-RC-0612HD bore = 14", Measured pipe OD is 8.625":**

$$\frac{14-8.625}{2}=2.6875"$$

4.2.4 Adjust the jackscrews (Figure 2, Item 2) in each ring half assembly (Figure 2, Item 1) so each jackscrew protrudes inside the clamp bore by the amount produced by 4.2.1 thru 4.2.3.

- 4.2.5 Remove the quick release pin (Figure 2, Item 4) from the latch joint at the bottom of each ring half assembly (reference Figure 6).
- 4.2.6 Open each ring half assembly. Place one ring half assembly on one open end of pipe and the second ring half assembly on the adjacent mating open end of pipe. As each ring half assembly is placed on the pipe, close the ring half assembly.

For the larger Super Clamp models (SC-RC-1218HD and above), use an approved double leg lifting chain by attaching it to the lifting points (defined in Figure 6).



WARNING: Keep extremities away from the bottom of the Super Clamp as well as away from in between the pipe and the Super Clamp. Failure to do so could result in serious injury.

- 4.2.7 Make any minor adjustments to the jackscrews until the latch joint (at the bottom of each ring half assembly) closes and the quick release pins (removed in 4.2.5) can be fully inserted and the ring half assembly can be shifted along the axis of the pipe.
- 4.2.8 Fully insert the quick release pins through the latch joint, thereby locking each ring half closed.
- 4.2.9 If using a lifting chain, detach it from the ring half assembly. Then, remove the lock nuts and screws installed in 4.1.1 / Figure 6.



WARNING: The Mathey Dearman Super Clamp is designed <u>only</u> for light reforming and accurate alignment operations. <u>IT IS NOT INTENDED FOR SUPPORT OR</u> **MATERIAL HANDLING PURPOSES.** Doing so could lead to damage to the Super Clamp and the pipe, as well as cause serious injury and death. Use extreme caution when using this product.

4.3 Assembly completion

4.3.1 Move the first ring half assembly along the axis of the pipe until distance between the center of the jackscrews and the center of the weld joint is roughly 3.75", as illustrated below in Figure 7.



Figure 7: Initial position of first ring half (with regard to the weld joint centerline)

This distance can be reduced to 1.25", if necessary to ease reforming.

- 4.3.2 Adjust the jackscrews so the ring half is centered on the pipe.
- 4.3.3 While keeping the ring half centered and on the pipe and squared to the open end (as much as possible), tighten the jackscrews (with the provided D900-005 breaker bar and DWR-300 socket²) to finger tight + ¼ turn.
- 4.3.4 With each of the four SC-RC-005 turnbuckle assemblies (Figure 2, Item 3), adjust each end until 7-8 thread are exposed, as illustrated below in Figure 8.

 $^{^{2}}$ The SC-RC-1824HD and larger Super Clamps have two breaker bars and sockets, as it is assumed two people will be adjusting each ring half in conjunction with each other.



Figure 8: Turnbuckle assembly setup

Note: If the gap is larger than 0.75", the number of exposed threads can be increased accordingly. For example, if the gap is 1.25" (the max gap the turnbuckle can close), adjust the ends until 13 threads are exposed on each side

4.3.5 Install each of the four SC-RC-005 turnbuckle assemblies onto this first ring half assembly, using the quick release pins (as illustrated in Figure 2). Be sure to place the "L" marked side of each turnbuckle assembly facing the same ring half assembly. Make sure the quick release pins are fully inserted through the mounting blocks and turnbuckle assemblies.



WARNING: If the quick release pins are not fully inserted, the Super Clamp could fail during operation and lead to serious damage to the device and pipe, as well as lead to severe injury or death.

- 4.3.6 Let the lower two turnbuckle assemblies hang down. Flip the upper two turnbuckle assemblies up.
- 4.3.7 Move the second ring half (on the other pipe) close enough to the weld joint so that the turnbuckle assemblies can be connected to both ring half assemblies (roughly 5.5" between each ring half assembly, as shown below in Figure 9.) However, do not connect the turnbuckle assemblies to the second ring half assembly.



Figure 9: Approximate distance between ring half assemblies during assembly completion

Note: If the gap is larger than 0.75", the distance would be greater. For example, if the gap were 1.25" (the max gap the turnbuckle can close), the distance would be closer to 6.5".

- 4.3.8 Adjust the jackscrews so the ring half is centered on the pipe.
- 4.3.9 While keeping the ring half centered and on the pipe and squared to the open end (as much as possible), tighten the jackscrews (with the provided D900-005 breaker bar and DWR-300 socket³) to finger tight + ¼ turn.
- 4.3.10 At this point, adjustments to the jackscrews (on each of the ring half assemblies) might have to be made in order for the each and every turnbuckle assembly to properly connect to both ring half assemblies.

For each ring half assembly;

- release the jackscrew pressure in the direction the ring half assembly needs to move, creating a gap between the pipe and the jackscrews
- tighten the jackscrew pressure on the opposite side (to finger tight + ¼ turn), thereby closing the newly formed gap between the pipe and the jackscrews

³ The SC-RC-1824HD and larger Super Clamps have two breaker bars and sockets, as it is assumed two people will be adjusting each ring half in conjunction with each other.

In order to get the best functionality out of the Super Clamp, it is recommended this process go back and forth on both ring half assemblies rather than adjust just one (i.e. take the required movement and divide it between the two ring half assemblies.)

Repeat this process until all four turnbuckle assemblies can successfully connect between the two ring half assemblies.

4.3.11 Verify all jackscrews on each ring half assembly are tight against their respective pipe ends.



WARNING: Before connecting the ring half assemblies with the turnbuckle assemblies, verify the pipe is properly supported. The Mathey Dearman Super Clamp **is not intended to be used as a support or material handling device**. Always exercise extreme caution when using this product, as there is risk of serious injury and death if not used properly.

4.3.12 Install each of the four turnbuckle assemblies onto the second ring half assembly, using the quick release pins (as illustrated in Figure 2). Make sure the quick release pins are fully inserted through the mounting blocks and turnbuckle assemblies.



WARNING: If the quick release pins are not fully inserted, the Super Clamp could fail during operation and lead to serious damage to the device and pipe, as well as lead to severe injury or death.

4.3.13 Tighten all jackscrews on both ring half assemblies an additional ¼ turn.

4.3.14 The Super Clamp is now completely assembled and ready for operation.

4.4 Operation (with Universal Jackbars)

If not using universal jackbars to adjust hi-lo positional alignment, skip to 0

4.4.1 Reduce the weld joint gap to the desired value by rotating the turnbuckles incrementally and evenly around the super clamp. For instance, rotate each turnbuckle ½ turn and then repeat that sequence rather than rotating just one or two a full turn and then rotating the remaining a full turn. This will guarantee equal load distribution on the turnbuckle assemblies and prevent them from seizing / binding.

Note: If the jackscrews are not properly tightened around the OD of both pipe sections, the Super Clamp will not function properly.



WARNING: Do not attempt to use the Super Clamp to close a gap larger than 1.25". Attempting to do so could cause a failure of the machine, damage to the pipe, and risk severe injury or death.

4.4.2 Check the positional relationship between the two pipe sections to determine the max hi-lo value and location.

Note: To precisely check hi-lo measurements on the inside diameter of the pipes / weld joint, it is recommended to use the Mathey Dearman Q.C. Welder's Gauge (D253E (English) or D253M (metric)

Check the hi-lo measurement against the max hi-lo capability listed in Table 3. If the hilo is greater than the corresponding tabulated value, the Super Clamp will not be able to adjust and function properly.



WARNING: Attempting to use the Super Clamp to adjust for hi-lo values greater than those listed in Table 3 can result in damage to the machine, the pipe, and risk serious injury.

- 4.4.3 Insert just one of the additionally included DC-501E jackscrews through each of the four included DC-820 universal jackbars (reference Figure 4).
- 4.4.4 Identify the pipe section that sits comparatively lower. On the ring half assembly that is clamped to this pipe section, insert one or two universal jackbars through the appropriate cutout location(s) that corresponds to the max hi-lo location. On the same ring half assembly (and only if necessary) insert one or two more universal jackbars through the cutout locations up to a max of 90° from the max hi-lo location. Figure 10 illustrates an example scenario.

Make sure all the utilized jackbars span across the weld joint to the other pipe section (that sits comparatively higher). The edge of the jackbars should be hanging at least 1.25" over the edge of this pipe.



Figure 10: Universal jackbar installation example scenario

- 4.4.5 Insert a second jackscrew through each of the open threads of the utilized jackbars.
- 4.4.6 <u>On the universal jackbars</u>, tighten the jackscrews on the pipe section (that sits comparatively lower) to finger tight.
- 4.4.7 <u>On the universal jackbars</u>, and starting with the max hi-lo location, tighten the jackscrews on the pipe section (that sits comparatively higher) until the proper alignment has been achieve.

Going back and forth between the jackscrew locations might be necessary, as adjusting the jackscrew on one universal jackbar could cause the pipe to shift at one of the other locations.

- 4.4.8 Gather the hi-lo measurements around the circumference, both on the OD and the ID of the pipes / weld joint.
- 4.4.9 At this point, if there is an out of round condition that requires reforming, the jackscrews located on the ring half assemblies can be used for this purpose.



WARNING: Check the out of round condition against the capabilities listed in Table 2. Do not attempt if the Super Clamp is not qualified as capable of reforming the out of round condition for the given pipe and Super Clamp model. Attempting to reform beyond the listed capabilities could result in damage / failure of the machine, damage to the pipe and risk severe injury or death.



WARNING: Do not use the jackscrews on the universal jackbars for reforming purposes. Attempting to do so could result in damage / failure of the machine, damage to the pipe and risk severe injury or death.

For an identified out of round condition on the pipe (at that specific location), tighten the jackscrew(s) until the desired reforming has been obtained.

4.4.10 Gather the hi-lo measurements around the circumference both on the OD and the ID of the pipes / weld joint, as well as the gap measurement. Make any minor adjustment necessary until the desired gap and hi-lo positional alignment has been achieved.

4.5 Operation (without Universal Jackbars)

Note: Using this approach for hi-lo and gap positional alignment will not allow for any reforming.

This section is to be followed after completing the steps up to 4.3.

4.5.1 Check the positional relationship between the two pipe sections to determine the max hi-lo value and location.

Note: To precisely check hi-lo measurements on the inside diameter of the pipes / weld joint, it is recommended to use the Mathey Dearman Q.C. Welder's Gauge (D253E (English) or D253M (metric)

Check the hi-lo measurement against the max hi-lo capability listed in Table 3. If the hilo is greater than the corresponding tabulated value, the Super Clamp will not be able to adjust and function properly.



WARNING: Attempting to use the Super Clamp to adjust for hi-lo values greater than those listed in Table 3 can result in damage to the machine, the pipe, and risk serious injury.

4.5.2 Note the offset of each of the two ring half assemblies of the Super Clamp, with respect to one another. In order for the hi-lo positional alignment to work (as detailed in the following steps), the ring half assemblies need to be offset with respect to one another (i.e. the turnbuckle assemblies cannot be perpendicular to the ring half assemblies). If not already so,

4.5.2.1 For each ring half assembly;

- release the jackscrew pressure in the direction the ring half assembly needs to move, creating a gap between the pipe and the jackscrews
- tighten the jackscrew pressure on the opposite side (to finger tight + ¼ turn), thereby closing the newly formed gap between the pipe and the jackscrews

In order to get the best functionality out of the Super Clamp, it is recommended this process go back and forth on both ring half assemblies rather than adjust just one

4.5.2.2 Repeat 4.5.2.1 until the two ring half assemblies until the noticeable offset has been achieved.

Figure 11 illustrates the idea of what 4.5.2 is attempting to describe.

No offset between the two ring half assemblies (turnbuckle assemblies perpendicular to the ring half assemblies) Result = Super Clamp will not be capable of hi-lo positional alignment





Offset between the two ring half assemblies

(turnbuckle assemblies not perpendicular to the ring half assemblies)

Figure 11: Proper offset between the two ring half assemblies so the Super Clamp will be capable of hi-lo positional alignment without the use of universal jackbars

4.5.3 Start reducing the weld joint gap by rotating the turnbuckles incrementally and evenly around the super clamp. For instance, rotate each turnbuckle ½ turn and then repeat that sequence rather than rotating just one or two a full turn and then rotating the remaining a full turn. This will guarantee equal load distribution on the turnbuckle assemblies and prevent them from seizing / binding.

Note: If the jackscrews are not properly tightened around the OD of both pipe sections, the Super Clamp will not function properly.



WARNING: Do not attempt to use the Super Clamp to close a gap larger than 1.25". Attempting to do so could cause a failure of the machine, damage to the pipe, and risk severe injury or death.

Notice that as the turnbuckle assemblies are rotated, not only is the gap closing but the hi-lo positional alignment changes as well. *In some case (but not all), rotating the turnbuckle assemblies will be all that is required to adjust both the gap and the hi-lo positional alignment.*

4.5.4 After making 2-3 complete rotations on all of the turnbuckle assembles, grab and attempt to lift each turnbuckle assembly joint. If any of the joint feels loose, more tightening is required. If all of the joint feels rigid, the jackscrews on each of the ring half assemblies can now be used to perform hi-lo positional alignment.

- 4.5.5 For each ring half assembly;
 - 4.5.5.1 Release the only jackscrew pressure in the direction the pipe needs to move, creating a gap between the pipe and these jackscrews.

Note: Do not release any more jackscrew pressure points than necessary to perform the hi-lo positional alignment. Releasing more than necessary will relieve the grip of the Super Clamp and the turnbuckle rigidity will go slack (thereby losing the hi-lo positional alignment capability).

- 4.5.5.2 Tighten the jackscrew pressure on the opposite side (to finger tight + ¼ turn), thereby closing the newly formed gap between the pipe and the jackscrews
- 4.5.5.3 Check each of the 4 turnbuckle assemblies for rigidity. Tighten if necessary (however be careful not to bind / seize)

Note: It is best to make incremental positional adjustments, rather than attempting to complete the hi-lo positional alignment in one pass.

In order to get the best functionality out of the Super Clamp, it is recommended this process go back and forth on both ring half assemblies, making hi-lo positional adjustments to both pipes rather than adjust just one.

4.5.6 Repeat 4.5.3 through 4.5.5 until the desired weld gap and hi-lo positional alignment has been achieved.

4.6 Use of the SC-RC-016 extended turnbuckles

If preheating the weld joint is required and it is desired to fit the heating coil / blanket / element in between the Super Clamp ring half assemblies, the SC-RC-016 (reference Figure 5) extended turnbuckles can be utilized.

Note: The extended turnbuckle bodies do not increase the Super Clamp's maximum gap capability of 1.25".



WARNING: Do not attempt to use the Super Clamp to close a gap larger than 1.25". Attempting to do so could cause a failure of the machine, damage to the pipe, and risk severe injury or death.

Note: Similar to 4.5, reforming out-of-round conditions is not possible when using the extended turnbuckles.

- 4.6.1 Complete steps 4.1 through 4.2
- 4.6.2 For each of the four SC-RC-005 turnbuckle assemblies, replace the SC-RC-004 turnbuckle body (reference Figure 3) with the SC-RC-016 extended turnbuckle body.
- 4.6.3 Move the first ring half assembly along the axis of the pipe until distance between the center of the jackscrews and the center of the weld joint is roughly 9.75", as illustrated below in Figure 12.



Figure 12: Initial position of first ring half (with regard to the weld joint centerline)

- 4.6.4 Complete 4.3.2 through 4.3.6
- 4.6.5 Move the second ring half (on the other pipe) close enough to the weld joint so that the turnbuckle assemblies can be connected to both ring half assemblies (roughly 19.5" between each ring half assembly, as shown below in Figure 13.) However, do not connect the turnbuckle assemblies to the second ring half assembly.



Figure 13: Approximate distance between ring half assemblies during assembly completion

Note: If the gap is larger than 0.75", the distance would be greater. For example, if the gap were 1.25" (the max gap the turnbuckle can close), the distance would be closer to 20.5".

- 4.6.6 Complete 4.3.8 through 4.3.14
- 4.6.7 Operate using the methods described in 4.5.

4.7 Disassembly

- 4.7.1 After welding and any required post heat / inspection has been completed, begin by releasing the jackscrew pressure on every jackscrew on any applicable universal jackbars (used in 4.4).
- 4.7.2 Release the jackscrew pressure on every jackscrew on each of the ring half assemblies.
- 4.7.3 Thread the jackscrews (on each of the ring half assemblies) in / out until the turnbuckle assemblies can be disassembled from the ring half assemblies.
- 4.7.4 Remove the quick release pins from the turnbuckle assemblies. Once the turnbuckle assemblies have been removed from the ring half assemblies. Insert the quick release pins into the turnbuckle assembly ends (as a method of keeping the components together).
- 4.7.5 If using the larger Super Clamp models that require the use of a double leg lifting chain, insert the 11.12C0.314 screws into the appropriate turnbuckle mounting blocks and sure with the 1L.12C0.000 lock nuts (reference Figure 6).
- 4.7.6 Attach the approved double leg lifting chain to the lifting points.



WARNING: Do not proceed to 4.7.7 until the lifting chain (if required) has been securely attached to the lifting points. Attempting to do so could cause a failure of the machine, damage to the pipe, and risk severe injury or death.

- 4.7.7 Thread the jackscrews out until the quick release pins keeping the ring half assembly latches locked closed can be removed.
- 4.7.8 Remove the quick release pins from each ring half assembly latch.
- 4.7.9 Open and remove each ring half assembly from the pipe, using the appropriate methods.

5.0 Inspection and Maintenance

After every use, it is recommended to perform these inspections to guarantee functionality and safety.

5.1 Ring half assemblies

For each of the two ring half assemblies (Figure 2, Item 1);

- 5.1.1 Using a straight edge, check the surface of the ring halves to determine if they were bent / deformed during operation.
- 5.1.2 Check the integrity of all welds.
- 5.1.3 Check for any crack indications.
- 5.1.4 Remove all jackscrews from the ring half assembly. Using a 7/8-9 UNC thread gauge, check each jacknut (through which the jackscrews are threaded into the ring half assembly). There should be no more than 0.010" of play between the thread gauge and the threaded jacknut.

Any signs of ring half deformations (being bent), weld integrity issues, crack indications, and / or damaged jacknut threads necessitate the replacement of that ring half assembly.



WARNING: Failure to replace a damaged ring half assembly could cause a failure of the machine, damage to the pipe, and risk severe injury or death.

5.2 Jackscrews

For every jackscrew;

5.2.1 Check the jackscrew to see if the swivel pad (see Figure 14 below) is still intact and rotates freely (while in contact) without binding.



Figure 14: Jackscrew swivel pad

- 5.2.2 Check the threads for galling / damage.
- 5.2.3 Check the Jackscrew for straightness (i.e. if it is bent)

Any indications of damage to a jackscrew (as described above) necessitate the replacement of that jackscrew.



WARNING: Failure to replace a damaged jackscrew could cause a failure of the machine, damage to the pipe, and risk severe injury or death.

5.3 Quick release pins

5.3.1 Check all quick release pins (Figure 2, Item 4) for evidence of yielding. If yield is detected, replace the quick release pins

5.4 Turnbuckle assemblies

For each of the turnbuckle assemblies;

- 5.4.1 Check the right hand and left hand thread (reference **Figure 3**) for any evidence of galled / damaged threads, as well as hole elongation and overall straightness.
- 5.4.2 Replace any damaged threads
- 5.4.3 Check the turnbuckle body (or the extended turnbuckle body, if used) for any evidence of galling / cross threading, as well as any signs of cracks or yielding.
- 5.4.4 Replace any damaged turnbuckle bodies.



WARNING: Failure to replace damaged turnbuckle components could cause a failure of the machine, damage to the pipe, and risk severe injury or death.

5.5 Universal Jackbars

If the universal jackbars (reference Figure 4) were used per 4.4, then for each jackbar;

- 5.5.1 Check the jackbar for cracks, deformation (signs of being bent) as well as to see if the threaded holes were galled / damaged.
- 5.5.2 Replace any damaged universal jackbars.

5.6 General Maintenance

- Lubricate all threads (jackscrews and turnbuckle threads) with a light coat of copper based anti-seize lubricant
- Store the Super Clamp in a clean, dry, and safe environment
- If the Super Clamp will not be used for an extended period of time, store the Super Clamp in the provided shipping container.

6.0 Justification of Mathey Dearman to void warranty

Any of the following will result in the voiding of the warranty described in 2.0:

- Improper use of the Super Clamp
- Lack of inspection / maintenance
- Unauthorized modifications / repairs to the Super Clamp
- Use of non-original spare parts or specific components called out in this operating manual
- Non-observance of the instructions called out in this operating manual
- Unusual events (i.e. facility disaster / natural disaster)

7.0 Recycling of Components

7.1 Separation of components

- Separate the components by category for a possible re-use or separate waste
- Reference local regulations concerning the disposal of components

7.2 Component composition

Stainless Steel: Jackscrew swivel pad Carbon Steel: Remaining components