CNC Saddle Machine
Parts & Operating Manual

MODELS: 03-0117-MSA ● 03-0117-1SA ● 03-0117-2SA

NOTE:
This version of Mathey CNC Saddle Machine Parts & Operating Manual supports software version 3.19

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<table>
<thead>
<tr>
<th></th>
<th>Table of Contents</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>PRECAUTIONS..................................................................................................... 4</td>
</tr>
<tr>
<td>2</td>
<td>GENERAL INFORMATION.................................................................................... 9</td>
</tr>
<tr>
<td>3</td>
<td>SPECIFICATIONS AND CAPABILITIES.................................................................. 11</td>
</tr>
<tr>
<td>4</td>
<td>COMPONENTS AND PARTS IDENTIFICATION .................................................... 14</td>
</tr>
<tr>
<td>5</td>
<td>PREPARING THE CNC SADDLE MACHINE FOR OPERATION .................................... 24</td>
</tr>
<tr>
<td>6</td>
<td>MATHEY CNC SOFTWARE.................................................................................. 36</td>
</tr>
<tr>
<td>7</td>
<td>TROUBLESHOOTING......................................................................................... 121</td>
</tr>
<tr>
<td>8</td>
<td>MAINTENANCE ............................................................................................... 124</td>
</tr>
<tr>
<td>9</td>
<td>WARRANTY ..................................................................................................... 127</td>
</tr>
<tr>
<td>10</td>
<td>INDEX OF FIGURES....................................................................................... 128</td>
</tr>
<tr>
<td>11</td>
<td>INDEX OF TABLES.......................................................................................... 130</td>
</tr>
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</table>

**NOTE:**
Specifications, descriptions and illustrative material in this literature are as accurate as known at the time of publication, but are subject to change without notice. Illustrations may include optional equipment and accessories, and may not include all standard equipment. For additional copies, or the current version of this manual, please visit [www.matheycnc.com](http://www.matheycnc.com).
Quick Start Guide

1. Setup laptop and software (See Section 6 for further details)

2. Take CNC machine out of the box and setup on pipe (See Section 5.1 for further details)

3. Setup Support Rod Assembly (1SA & 2SA Only) (See Section 0 for further details)

4. Install the cutting apparatus (See Section 5.4 for further details)

5. Plug in all cables and connect to AC power & laptop (See Section 5.5 or further details)

6. Turn on CNC machine first before launching the software (See Section 5.6 for further details)

7. Launch MatheyCNC Software (See Section 6.3 for further details)

8. You’re ready to go!

NOTE: The Mathey Dearman CNC Saddle Machine requires only minimal maintenance; however, these are precision machines. In order to achieve proper results, make sure the machine is handled with reasonable care and is kept clean and lubricated. The machine should be stored in the Mathey Dearman CNC Machine Storage Container during transportation and when not in use. Please refer to Section 8: Maintenance for full details.
1 Precautions

**ELECTRIC SHOCK CAN KILL**

Electric Shock can injure or kill. CNC 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.
- 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.

**AUTOMATIC OPERATION**

The CNC Saddle Machine may operate automatically without warning. Only a trained individual familiar with the software, machine, and computer system should operate this equipment. Keep the immediate area around the CNC Saddle Machine clear of materials that may cause interference. Keep area clear of bystanders. All untrained persons should not work on or near a CNC machine. Do not leave the CNC machine unattended while power is on to any electronics.

**NOISE**

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:
  
<table>
<thead>
<tr>
<th>Metal</th>
<th>Metal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Antimony</td>
<td>Lead</td>
</tr>
<tr>
<td>Arsenic</td>
<td>Manganese</td>
</tr>
<tr>
<td>Barium</td>
<td>Mercury</td>
</tr>
<tr>
<td>Beryllium</td>
<td>Nickel</td>
</tr>
<tr>
<td>Cadmium</td>
<td>Selenium</td>
</tr>
<tr>
<td>Chromium</td>
<td>Silver</td>
</tr>
<tr>
<td>Cobalt</td>
<td>Vanadium</td>
</tr>
<tr>
<td>Copper</td>
<td></td>
</tr>
</tbody>
</table>

- 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:
  - Lead from lead-based paint.
  - 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 CNC 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:

<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td>Less than 20A</td>
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<td>40A-60A</td>
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<td>60A-300A</td>
<td>8</td>
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<td>300A-400A</td>
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<td>12</td>
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<tr>
<td>400A-800A</td>
<td>10</td>
<td>14</td>
</tr>
</tbody>
</table>

**HEAVY COMPONENTS**

CNC Saddle Machines in their storage cases and certain components of the Mathey Dearman CNC Saddle Machine are heavy. Use caution when lifting or moving these items. 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.

**ELECTRIC 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 CNC Saddle Machines in motion can create pinch points in normal operation. Be aware of all areas that may potentially be a hazard when the CNC Saddle Machine is in motion. Avoid working on the machine while the control electronics are energized. CNC machines may use hard stops as part of normal setup, while in motion these stops may be contacted creating a crush point. Do not allow hoses, cords or other nearby items to come in contact with the machine.

HOT MATERIALS
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.

MECHANICAL DRIVES
Mechanical drives are in use while the CNC Saddle Machine is in operation. These drives use gears, chains, and drive screws. These components can move at high speed. Do not attempt to service, adjust, or otherwise touch these components while the machine is on. Secure loose articles of clothing and cables to prevent entanglement.

AIR LINES UNDER PRESSURE
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.
PUBLICATIONS

Refer to the following standards or their latest revisions for more information:

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

2.1 Cutting Apparatus
- Mathey Dearman CNC Saddle Machines are designed to accurately fixture and guide a 1 3/8” (35mm) diameter, 10” or longer, oxy/fuel machine cutting torch or a 1 3/8” (35mm) diameter plasma arc machine torch to cut, profile, and bevel horizontal pipe.

2.2 Pipe Size Ranges
- The MSA CNC Saddle Machine includes a Spacer Set that positions the machine to accurately cut 2”/ 50mm, 3”76mm and 4”102mm API Line Pipe.
- The 1SA CNC Saddle Machine includes a Spacer Bolt Set that positions the machine to accurately cut 3”/76.2mm, 4”/101.6mm, 6”/152.4mm and 8”/203.2mm API Line Pipe.
- 2SA CNC Saddle Machine includes Spacer Bolts or Step Spacers for 6”/152.4mm, 8”/203.2mm, 10”/254mm and 12”/305mm API Line Pipe.
- Spacer bolts are available for other pipe or tubing sizes within the machine cutting range.
- Optional Step Spacers which function to replace individual Spacer Bolts are available to purchase for 1SA and 2SA models. See your Mathey Dearman distributor for pricing and availability.

2.3 Available Cut Profiles
- Mathey Dearman CNC Saddle Machines are capable of producing an almost infinite number of shapes and contours on pipe. In addition to the common end shapes and holes available for selection through the MatheyCNC software interface, custom shapes can be created for specialized applications. Contact your Mathey Dearman distributor for details.

2.4 Operator Training
- MatheyCNC software is designed to be simple and intuitive to operate. Cuts are created through a series of graphical selection screens. No specialized training is required, however basic knowledge of the Microsoft Windows® computer operating system is recommended. We advise that you read and fully understand this Parts and Operating manual as well as the operating instructions for your cutting system (torch or plasma arc) before attempting to use the Mathey Dearman CNC Saddle Machine to make cuts.
2.5 CNC Saddle Machine Storage Case and Contents (Figure 2-1)

Table 2-1 CNC Saddle Machine Contents

<table>
<thead>
<tr>
<th>Item</th>
<th>Part Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>03.0117.000</td>
<td>USB STORAGE DRIVE WITH MATHEY CNC SOFTWARE</td>
</tr>
<tr>
<td>2</td>
<td>03.0117.001</td>
<td>TORCH CARRIAGE AND LEADSCREW ASSEMBLY</td>
</tr>
<tr>
<td>4</td>
<td>03.0117.003</td>
<td>MSA CNC SADDLE MACHINE – BASE UNIT</td>
</tr>
<tr>
<td>4</td>
<td>03.0117.004</td>
<td>1SA CNC SADDLE MACHINE – BASE UNIT</td>
</tr>
<tr>
<td>4</td>
<td>03.0117.005</td>
<td>2SA CNC SADDLE MACHINE – BASE UNIT</td>
</tr>
<tr>
<td>5</td>
<td>03.0117.1SABOX</td>
<td>STORAGE &amp; TRANSPORT CASE</td>
</tr>
<tr>
<td>6</td>
<td>03.0203.051</td>
<td>USB CABLE, COMPUTER TO CNC SADDLE MACHINE</td>
</tr>
<tr>
<td>7</td>
<td>03.0203.070</td>
<td>8-PIN CORDSET</td>
</tr>
<tr>
<td>8</td>
<td>03.0203.082</td>
<td>POWER CABLE</td>
</tr>
<tr>
<td>9</td>
<td>1H.56C0.000</td>
<td>NUT, 5/16&quot; HEX NC</td>
</tr>
<tr>
<td>10</td>
<td>03.0203.101</td>
<td>Hypertherm Plasma Auto-Fire Cable</td>
</tr>
<tr>
<td>11</td>
<td>03.0203.102</td>
<td>Victor Technologies Plasma Auto-Fire Cable</td>
</tr>
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</table>

**NOTE:** All Torches, Hypertherm Plasma Auto-Fire Cable (10) & Victor Technologies Plasma Auto-Fire Cable (11) sold separately.
### 3 Specifications and Capabilities

<table>
<thead>
<tr>
<th>Table 3-1 CNC Saddle Machine General Specifications</th>
</tr>
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<tbody>
<tr>
<td><strong>Parameter</strong></td>
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<tr>
<td>AC Voltage In* (115 range/ 230 range)</td>
</tr>
<tr>
<td>Operating Temperature (Low Current)</td>
</tr>
<tr>
<td>Operating Temperature (High Current)</td>
</tr>
<tr>
<td>Storage Temperature</td>
</tr>
<tr>
<td>Storage Humidity (non-condensing)</td>
</tr>
<tr>
<td>Operating Humidity (non-condensing)</td>
</tr>
<tr>
<td>Vibration (± 7.35 M/(SxS) on X, Y and Z Axis)</td>
</tr>
<tr>
<td>Surface Speed</td>
</tr>
<tr>
<td>Lead In Length</td>
</tr>
<tr>
<td>Lead Out Length</td>
</tr>
<tr>
<td>Clocking Angle</td>
</tr>
<tr>
<td>Default Cut Speed</td>
</tr>
<tr>
<td>Default Miter Angle</td>
</tr>
<tr>
<td>Branch Angle Allowable</td>
</tr>
<tr>
<td>Machine Z Travel Maximum</td>
</tr>
<tr>
<td>Saddle Hole Kerf Outward Offset</td>
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<tr>
<td>Z Offset Min</td>
</tr>
<tr>
<td>Follow Through Length</td>
</tr>
<tr>
<td>Header Diameter Max (Custom)</td>
</tr>
<tr>
<td>Centerline Offset</td>
</tr>
<tr>
<td>USB Port Protocol</td>
</tr>
<tr>
<td>Operating System</td>
</tr>
<tr>
<td>Software</td>
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<td>Software Drivers</td>
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*Auto Selectable
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<thead>
<tr>
<th>Nominal Sizes – API Line Pipe</th>
<th>Max Speed (IPM)</th>
</tr>
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<tbody>
<tr>
<td>1 1/2</td>
<td>38</td>
</tr>
<tr>
<td>2</td>
<td>45</td>
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<tr>
<td>2 1/2</td>
<td>45</td>
</tr>
<tr>
<td>3</td>
<td>45</td>
</tr>
<tr>
<td>3 1/2</td>
<td>45</td>
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<tr>
<td>4</td>
<td>45</td>
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**1SA**

<table>
<thead>
<tr>
<th>Nominal Sizes – API Line Pipe</th>
<th>Max Speed (IPM)</th>
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<tbody>
<tr>
<td>3</td>
<td>31</td>
</tr>
<tr>
<td>3 1/2</td>
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<td>4</td>
<td>40</td>
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<td>5</td>
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**2SA**

<table>
<thead>
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<th>Nominal Sizes – API Line Pipe</th>
<th>Max Speed (IPM)</th>
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<tr>
<td>6</td>
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<tr>
<td>8</td>
<td>45</td>
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<td>10</td>
<td>45</td>
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<tr>
<td>12</td>
<td>45</td>
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</tbody>
</table>

**Table 3-3 Cutting Capability – Pipe Sizes by Model**

<table>
<thead>
<tr>
<th>CNC Saddle Machine Model</th>
<th>Nominal Sizes – API Line Pipe</th>
<th>Custom Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>MSA</td>
<td>1 1/2 2 2 1/2 3 3 1/2 4</td>
<td>1.9” - 4.5”</td>
</tr>
<tr>
<td>1SA</td>
<td>3 3 1/2 4 5 6 8</td>
<td>3.5” - 8.625”</td>
</tr>
<tr>
<td>2SA</td>
<td>6 8 10 12</td>
<td>6.625” - 12.75”</td>
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Table 3-4 Cutting Capability – Maximum Miter Angles

<table>
<thead>
<tr>
<th>Model</th>
<th>NPS</th>
<th>OD (in)</th>
<th>Available Travel Length (in)</th>
<th>Axial Cut Distance (in)</th>
<th>Maximum Allowable Miter Cut Angle (deg)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1 1/2</td>
<td>1.9</td>
<td>14</td>
<td>13.52</td>
<td>82</td>
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<tr>
<td>MSA/1SA/2SA</td>
<td>2</td>
<td>2.375</td>
<td>14</td>
<td>13.47</td>
<td>80</td>
</tr>
<tr>
<td></td>
<td>2 1/2</td>
<td>2.875</td>
<td>14</td>
<td>13.53</td>
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<tr>
<td></td>
<td>3</td>
<td>3.5</td>
<td>14</td>
<td>13.06</td>
<td>75</td>
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<td></td>
<td>3 1/2</td>
<td>4</td>
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<td>13.95</td>
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<td>13.76</td>
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<td>12.75</td>
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<td>13.67</td>
<td>47</td>
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Table 3-5 Cutting Capability – Maximum Saddle Angles

<table>
<thead>
<tr>
<th>Header Axial Distance (in) when header NPS is 12</th>
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<tbody>
<tr>
<td>Branch NPS</td>
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<td>--------------</td>
</tr>
<tr>
<td>90 (T-Cut)</td>
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<tr>
<td>85</td>
</tr>
<tr>
<td>80</td>
</tr>
<tr>
<td>75</td>
</tr>
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4 Components and Parts Identification

Figure 4-1 MSA CNC Saddle Machine Component Assembly (Part# 03-0117-003)
### Table 4-+1 MSA CNC Saddle Machine Component Assembly Parts Identification

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Part Number</th>
</tr>
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<td>Hex Head Cap Screw, 1/4-20 x 1&quot; lg.</td>
<td>10-14C0-100</td>
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<tr>
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<td>03-0117-033</td>
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<td>Motor Bracket, Back</td>
<td>03-0117-029</td>
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<td>NEMA 34 Stepper Motor</td>
<td>01-0249-064</td>
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<td>Ring Gear Cover, MSA</td>
<td>03-0117-021</td>
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<td>Motor Coupling</td>
<td>03-0204-002</td>
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<td>Rear Standoff - MSA</td>
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<td>26-10C0-034</td>
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<td>Hex Head Cap Screw, 1/4-20 x 5/8&quot; lg.</td>
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Figure 4-2 1SA CNC Saddle Machine Component Assembly (Part# 03-0117-004)
Table 4-2 1SA CNC Saddle Machine Component Assembly Parts Identification

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<tr>
<td>2</td>
<td>Hex Head Cap Screw, 1/4-20 x 5/8” lg.</td>
<td>10-14C0-058</td>
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<tr>
<td>3</td>
<td>Button Head Cap Screw, #10-24 x 3/4” lg.</td>
<td>26-10C0-034</td>
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<td>4</td>
<td>Motor Coupling</td>
<td>03-0204-002</td>
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<td>NEMA 34 Stepper Motor</td>
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<tr>
<td>6</td>
<td>Hex Head Cap Screw, 3/8-16 x 1” lg.</td>
<td>10-38C0-100</td>
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<td>Handle, Round-Grip Pull</td>
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<td>8</td>
<td>Washer, 1/4” Flat</td>
<td>12-0014-F00</td>
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<td>Button Head Cap Screw, 1/4-20 x 1/2” lg.</td>
<td>26-14C0-012</td>
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<td>03-0117-030</td>
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<td>03-0117-080</td>
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<td>Cover, Ring Gear 1SA</td>
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<td>Hex Nut, 3/8-16</td>
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Figure 4-3 2SA CNC Saddle Machine Component Assembly (Part# 03-0117-005)
# Table 4-3 2SA Saddle Machine Component Assembly Parts Identification

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<tr>
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<td>Handle, Round-Grip Pull</td>
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<td>Hex Head Cap Screw, 3/8-16 x 1” lg.</td>
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<td>6</td>
<td>Hex Nut, 3/8-16</td>
<td>1H-38C0-000</td>
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<td>7</td>
<td>2SA Saddle Machine</td>
<td>03-0117-057</td>
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<td>Bracket, Motor Back – 2SA</td>
<td>03-0117-031</td>
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<td>Cover Standoff – 2SA</td>
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<td>Standoff, Rear - 1SA/2SA</td>
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<td>Motor Coupling</td>
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<td>Cover, Ring Gear – 2SA</td>
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<td>14</td>
<td>Button Head Cap Screw, 1/4-20 x 1/2” lg.</td>
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Figure 4-4 Leadscrew and Carriage Assembly (Part# 03-0117-001)
Table 4-4 Leadscrew and Carriage Assembly Parts Identification

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<tr>
<td>1</td>
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<td>01-0249-062</td>
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<td>2</td>
<td>Torch Carriage Block</td>
<td>03-0117-012</td>
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<tr>
<td>3</td>
<td>Socket Head Cap Screw, M3-0.5 x 50mm lg.</td>
<td>03-0117-017</td>
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<td>4</td>
<td>Hex Head Cap Screw, 1/4-20 x 1”</td>
<td>10-14C0-100</td>
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<td>Hex Nut, Locking 1/4-20</td>
<td>1H-14C0-000</td>
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<td>Hex Nut, 5/16-18</td>
<td>1H-56C0-000</td>
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<td>Swivel Eye, Short Right 5/16-18</td>
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<td>8</td>
<td>Beam End Block</td>
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<td>03-0117-041</td>
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<td>05-0510-117</td>
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<td>Panel Mount Connector</td>
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<td>03-0116-020</td>
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<td>32</td>
<td>Support Rod (1SA)</td>
<td>03-0117-050</td>
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<td>33</td>
<td>Swivel Eye, Left 5/16-18</td>
<td>03-0116-022</td>
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<td>Support Bar</td>
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Figure 4-5 Machine Control Module (MCM) Assembly (Part#03-0117-002)
### Table 4-5 Machine Control Module (MCM) Parts Identification

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<td>PCB Bracket Assembly</td>
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5 Preparing the CNC Saddle Machine for Operation

NOTE: Proper spacers, spacer bolts or step spacers must be selected and installed on the Mathey CNC Saddle Machine before mounting and executing cuts.

5.1 Mounting the Mathey CNC on the Pipe

5.1.1 Remove the CNC Saddle Machine Component Assembly (Figure 5-7, Item 1) from the storage box.

5.1.2 Spacer bolt Installation (1SA / 2SA Only)

5.1.2.1 Select the correct Spacer Bolt for pipe being cut. The top of the spacer bolt storage box will help with the selection of the correct spacer for standard pipe sizes.

![Figure 5-1 Spacer Bolt Storage Box](image1)

5.1.2.2 Install the Spacer Bolts (4 bolts) in the four (4) holes in the 1SA/2SA Machine Saddle, with the threaded end of the Bolts near the inside bore (I.D.) of the Saddle.

![Figure 5-2 Installation of Spacer Bolt](image2)
5.1.2.3 Secure Spacer Bolts to the Saddle by threading Hex Nut onto the threaded portion on the topside of Saddle. The hex nut does not have to be tightened with a wrench as the purpose of the nut is to secure the spacer bolt to the Saddle.

5.1.3 Spacer Bolt Installation (MSA Only)

5.1.3.1 Select the correct spacer for pipe being cut. The Saddle is placed on the pipe without spacers for cutting 4”/101.6mm pipe.

5.1.3.2 Place the spacer on the inside the front Saddle and align the threaded hole in the spacer with the hole in the front of the Saddle.

Figure 5-3 MSA Spacer Bolt Installation

5.1.3.3 Secure Spacer to the Saddle by placing 1/4-20 X 5/8” machine screw through the hole in the top side of the Saddle and threading it into the Spacer. The machine screw does not have to be tightened with a wrench as the purpose of the nut is to secure the spacer bolt to the Saddle.

5.1.4 Boomer Assembly Installation (1SA / 2SA Only)

Figure 5-4 1SA / 2SA Spring Boomer Latch Assembly

5.1.4.1 Place the hook of the Boomer (Figure 5-4, Item 1) into the Boomer Eye on the Saddle. (See Figure 5-5)

5.1.4.2 Place the Spring Snap (Figure 5-4 Item 4) into the Boomer Eye on the other side of the Saddle (Figure 5 Item 1).
5.1.4.3 In order to get a stable installation of the Saddle Machine, the Chain (Figure 5-4, Item 3) of the Boomer Assembly must be adjusted on the Spring Snap (Figure 5-4, Item 4) so that the spring is stretched approximately 1/2" -3/4" (12 - 19mm) when the Boomer is closed.

5.1.4.4 When the Chain is properly adjusted, close the Boomer. (See Figure 5-5)

Figure 5-5 1SA / 2SA Spring Boomer Latch Installation

5.1.5 Boomer Assembly Installation (MSA Only)

5.1.5.1 Place the Eye of the Boomer Assembly over ¼-20 x ¾" Socket Head Cap Screw located on the Saddle. (See Figure 5-6)

5.1.5.2 Tighten the Thumb Screw of the Boomer Assembly to secure the machine to the pipe.

Figure 5-6 MSA Boomer Assembly Installation
5.1.6 Mount the CNC Saddle Machine squarely on the pipe so that the area to be cut is located within approximately 12” (300mm) of the base machine. All spacer bolts or step spacers should be in solid contact with the pipe.

Figure 5-7 CNC Saddle Machine Component Assembly
5.2 Carriage and Leadscrew Installation

5.2.1 Remove 3 each of the 5/16-18 hex nuts located on the studs on the ring gear.

5.2.2 Mount the carriage and leadscrew assembly (Figure 5-8 Item 10) to the ring gear (Figure 5-7, Item 11) using the provided 5/16-18 hex nuts (not shown). First, tighten the (2) outer nuts using the provided 1/2" wrench. Next finger tighten the center nut, then using the 1/2" wrench, tighten the center nut 1/4 turn.

**NOTE:** Over tightening the center nut could cause damage to the carriage and leadscrew assembly.

![Figure 5-8 Mounting the Leadscrew Assembly](image)

5.3 Support Rod Installation

**NOTE:** Support Rod length has been pre-set at the factory, however minor adjustment may be required after field assembly to ensure the most accurate cuts possible.

5.3.1 Screw right hand nuts (Figure 5-9, Item 8) all the way on to right hand swivel studs (Figure 5-9, Item 6).

![Figure 5-9 Swivel Stud to Ring Gear Diagram](image)
5.3.2 Screw the right hand swivel studs (Figure 5-9, Item 8) into the threaded holes at the 3:00 and 9:00 O’clock position in the ring gear until the swivel studs are flush with the back side of the ring gear and the swivel eye is oriented as shown in Figure 5-9.

5.3.3 Place the support bar (Figure 5-7, Item 2) on to the carriage and leadscrew assembly (Figure 5-7, Item 10) with the slot facing downward and the nearest threaded hole to the left of the slot.

**NOTE:** It may be necessary to compress the sheet metal in order for the support bar to fit the carriage and leadscrew assembly correctly.

5.3.4 Align the hole in the slot of the support bar (Figure 5-7, Item 2) with the threaded hole in the bottom of the carriage and leadscrew assembly (Figure 5-7, Item 10) and Insert the 5/16-18 x 3/4 hex head cap screw (Figure 5-10, Item 14) through the hole in the support bar (Figure 5-10, Item 2) and thread it into the carriage and leadscrew assembly (Figure 5-7, Item 10) until it is flush with the support bar.

![Figure 5-10 Support Bar to Leadscrew Assembly](image)

5.3.5 Place the 5/16-18 x 1" hex head cap screw (Figure 5-9, Item 9) through the right hand swivel stud located on the right ring gear with the thread facing outward as shown in Figure 5-9.

5.3.6 Place the hole of the swivel stud (Figure 5-9, Item 4) located on support rod (Figure 5-9, Item 12) over the 5/16-18 x 1" hex head cap screw and install the Hex nut (Figure 5-9, Item 7).

**NOTE:** Hand tighten all fasteners at this time.

5.3.7 Make sure the hex nut (Figure 5-9, Item 8) on the right hand swivel stud in the ring gear and hex nut (Figure 5-9, Item 8) on the right hand swivel stud in the support bar are loose.

5.3.8 Place the 5/16-18 x 1" hex head cap screw (Figure 5-11, Item 9) through the right hand swivel stud (Figure 5-11, Item 6) located in the support bar (Figure 5-7, Item 2) with the thread facing outward as shown in Figure 5-11.
5.3.9 Follow the same procedure for the installation of the right hand swivel stud in left side of the ring gear.

5.3.10 Place the other swivel stud (Figure 5-11, Item 5) located on the other end of the support rod (Figure 5-9, Item 12) over the 5/16-18 x 1” hex head cap screw (Figure 5-11, Item 9) and install the hex nut (Figure 5-11, Item 7).

**NOTE:** Hand tighten all fasteners at this time.

5.3.11 Tighten the 5/16-18 x 1” bolt and nut with the provided 1/2” combination wrench allowing the 2 faces of the swivel eyes to come into alignment.

**NOTE:** The support rods are preset from the factory and should need little to no adjustment.

5.3.12 Tighten hex nut (Figure 5-9, Item 8) on the right hand swivel stud in the ring gear and hex nut (Figure 5-9, Item 8) on the right hand swivel stud in the support bar (not Shown).

5.3.13 Mount the torch in the torch holder and set the torch tip off the pipe the recommended distance according to the manufacturer of the torch being used.

5.4 Installing the Cutting Apparatus

5.4.1 Insert a 10” / 254mm long 1 3/8” / 36mm diameter oxy/fuel or plasma arc machine torch (not supplied) into Rack Adjustable Torch Holder (Fig. 5 Item 17) and adjust torch tip to pipe height per the torch manufacturer’s instructions. Tighten the Socket Head Cap Screws to secure the torch in the Torch Holder. A 10” long machine torch is required to allow the 1SA CNC Saddle Machine to cut all pipe diameters within its range. The Torch Holder is compatible only with a 1 3/8” / 35mm diameter oxy/fuel or Plasma arc machine torch with a 32-pitch rack. A torch holder to accommodate a metric torch rack is available separately. It is not necessary to use a machine torch fitted with a rack for height adjustment. However, if faster torch height adjustment is desired the torch holder is designed to accept a torch with rack. To increase or decrease the friction of the torch in the Torch Holder, tighten the Allen Head Cap Screws with a 5/32” Allen wrench.

5.4.2 After the fuel or plasma arc torch is installed and before executing a cut, jog the torch fully around the pipe to ensure the torch tip to pipe surface distance remains within the torch manufacturer's specifications. To obtain proper torch height when cutting the smallest pipe diameter in the machine's range, it may be necessary to relocate the torch bracket (03-0116-082) to the bottom side of the torch carriage assembly by removing the two (2) Allen Head Cap Screws and reinstalling the bracket on the underside of the torch carriage.
5.4.3 If using an Oxy/fuel cutting torch, select the correct cutting tip for the material, wall thickness and fuel gas per the torch manufacturer’s instructions.

5.4.4 Prepare the torch cutting system for operation by following the manufacturer’s instructions.

5.4.5 Connect up the laptop and all associated equipment necessary for CNC Saddle Machine operation.

Figure 5-12 CNC Saddle Machine Components and Connections

5.5 Installing Cables

5.5.1 Install the female-threaded end of the yellow 8-Pin Cordset (Figure 2-1, Item 7) into large 8-Pin Panel Connector (Figure 5-12, Item 6) located on the back of the Machine Control Module (MCM). Hand-tighten fully.

5.5.2 Install the male-threaded end of the yellow 8-Pin Cordset (Figure 2-1, Item 7) into large 8-Pin Panel Connector (Figure 5-12, Item 10) located on the end of the Carriage and Leadscrew Assembly. Hand-tighten fully.

5.5.3 Install USB Cable (Figure 2-1, Item 6) into USB Panel Mount Connector (Figure 5-12, Item 5) located on the side of the Machine Control Module (MCM). Make sure the white arrows on the connectors align. Tighten the threaded locking ring securely by hand.

5.5.4 Install the other end of the USB Cable (Figure 2-1, Item 6) into any open USB port on the laptop computer being used.

5.5.5 Press the red E Stop button (Figure 5-12, Item 1) until an audible click is heard and the button remains in its lowest fully-depressed position.

5.5.6 Install the female end of the AC Power Cord (Figure 2-1, Item 8) into the AC Connector (Figure 5-12, Item 8) located on the side of the Machine Control Module (MCM).

5.5.7 Plug the male end of the AC Power Cord (Figure 2-1, Item 8) into a 115 or 230 VAC power source. For allowable voltages see Table 3-1 CNC Saddle Machine General Specifications.
5.6 Final Prep

5.6.1 When ready to begin configuring a cut, twist the red E Stop Switch (Figure 6 Item 4) to power on the Mathey CNC Saddle Machine. The red Power LED (Figure 6 Item 16) will illuminate on the Machine Control Module indicating the machine is powered on. A blue communication LED (Figure 6 Item 17) will illuminate if the USB cable is connected and the laptop is powered on. The blue LED indicates the CNC Saddle Machine is communicating with the laptop computer and is ready to configure and execute cuts once the MatheyCNC software is installed, activated, & launched.

5.6.2 At the Cut Configuration Screen go to the Settings menu in the bottom left hand corner. (See Figure 5-13)

Figure 5-13 Cut Configuration Screen
5.6.3 Select the Jog/Machine info screen. (See Figure 5-14)

Figure 5-14 Settings Screen
5.6.4 Select the Jog/machine info screen. (See Figure 5-15)

**Figure 5-15 Jog/Machine Info Screen**

**NOTE:** The Jog/Machine Info Screen is also a diagnostic screen indicating key components are functioning properly.

5.6.5 Use the arrows at top left to rotate and move the torch tip along the surface of the pipe.

5.6.6 Observe the torch tip to pipe distance at the home position (3) and the end position (4) locations. The distance should be equal. If so then go to 5.6.9.

5.6.7 Loosen both hex nuts (Figure 5-9, Item 13 & Figure 5-11, Item 7) at the ends of the support rod (Figure 5-9, Item 12)

**NOTE:** Exercise caution as one end will have a right hand nut and the other end will have a left hand nut. The end of the support rod that has a left hand nut will be marked with an "L".

5.6.8 Adjust both support rods evenly until the cutting tip to pipe distance is the same at the home position (3) and end position (4) of torch arm travel.

5.6.9 Rotate the Ring Gear in both directions into the Saddle and Cap Ring assembly. The Ring Gear should move into the Saddle and Cap Ring assembly without deviation or interruption.

5.6.10 If necessary, adjust the support rods so that the Ring Gear enters the Saddle and Cap Ring cavity properly.

5.6.11 If no adjustment is necessary, tighten both hex nuts (Figure 5-9, Item 13 & Figure 5-11, Item 7) at the ends of the support rods (Figure 5-9, Item 12).
5.6.12  Recheck all hex nuts to make sure they are tight.

5.6.13  The machine is now ready to run.

**NOTE:** The calibration process must be completed each time the CNC machine is powered on.

**NOTE:** The MatheyCNC software must be properly installed, user registered, and software activated (See Section 6) in order to operate the CNC machine.
6  MatheyCNC Software

MatheyCNC pipe cutting software is designed to be simple, reliable, and robust. In a short amount of time almost any user can learn to use the full range of software features to create an almost unlimited number of different cuts.

**NOTE:** MatheyCNC software is pre-loaded on the provided laptop computer. However, registration of software is necessary to start operating the CNC machine.

6.1  Installation

6.1.1  Included with the Mathey CNC Saddle Machine is a Mathey Dearman USB flash drive (Figure 6-1). Plug this USB flash drive into an open USB slot on the laptop computer.

![Figure 6-1 Mathey Dearman USB flash drive](image)

6.1.2  The USB flash drive contains two (2) files (Figure 6-2): 'Mathey CNC.exe' software and 'Arcus Drivers and Tools Setup 1.xx'. The first step is to install 'Arcus Drivers and Tools Setup 1.xx.exe'.

6.1.3  Next, install the 'Mathey CNC.exe' file. If the computer operates on Microsoft Windows 8.x operating system, first use this workaround, (see below). For previous versions (XP, Vista, or 7) of Windows operating systems, start the installation and continue with Section 6.1.4.

![Figure 6-2 Contents of the Mathey Dearman USB flash drive](image)

**Windows 8.x Workaround**

1. From the Start Screen, open Settings (move your mouse to the bottom-right-corner of the screen and wait for the pop-out bar to appear, and then click the Gear icon).
2. Click ‘More PC Settings’ or ‘Change PC Settings’
3. Click ‘General’.
4. Scroll down, and click ‘Restart now’ under ‘Advanced startup’.
5. Click ‘Troubleshoot’.
6. Click ‘Advanced Options’
7. Click ‘Startup Settings’
8. Click Restart.
9. When the computer restarts, select “Disable driver signature enforcement” from the list. Attempt to reinstall the driver after this is done.
6.1.4 Once the installation wizard has been completed, install the MatheyCNC software by double clicking the icon.

6.1.5 After this process is complete the software is installed and ready to activate.

6.1.6 The installer will create a Mathey CNC icon on the computer desktop (Figure 6-3). To start the software activation process, double-click on this icon (Figure 6-3).

![Figure 6-3 MatheyCNC Desktop Icon](image)

6.2 Software Activation & Registration

**NOTE:** If the software is version 3.1.5 or greater, skip to step 6.2.12.

6.2.1 Open the software and you should see the following screen. Click on “Evaluation Mode”.

![Image of Mathey CNC Activation Code](image)

6.2.2 Then you should see the following screen. Click “OK”.

![Image of error message](image)
6.2.3 When you get to the Main Screen, click on “Settings” in the bottom left hand corner.
6.2.4 When the Settings screen comes up, click on “Check for Updates”

**NOTE:** The laptop must be connected to a wireless network for the MatheyCNC software to connect to the update server.
6.2.5 When the Information box pops up, click “OK”

6.2.6 After the software downloads the update, click “OK”.
6.2.7 When the software downloads, it will automatically start the installation. When the installation screen opens, click “next”.

![Installation Screen](image)
6.2.8 Then click, “install”.

Click here

Click here
6.2.9 Once complete, click “Finish”.

6.2.10 After the program installs it will put an icon on the desktop. Click the Mathey CNC icon to start the software.
6.2.11 Once you click the desktop icon, the following screen will appear.

6.2.12 Once the splash screen above goes away, the following activation screen will appear. Click on the “software activation” button.
6.2.13 To create a new account, click on the “Create New Account” button.
6.2.14 Fill in all necessary fields in the screen below, then click "next".

**NOTE:** The user name and password created can be used in the online web portal found at www.matheycncportal.com. The web portal is where you can go to update your profile settings, user information, or check activation status. For questions regarding the web portal, please contact Mathey Dearman Sales Department at sales@mathey.com or +1-918-447-1288.

Once all fields are completed, click "Next".
6.2.15 Fill in all necessary fields in the screen below, then click “next”.

**NOTE:** To update your profile settings, user information, or check activation status, please visit [www.matheycncportal.com](http://www.matheycncportal.com). The user name and password created in Section 6.2.14, can be used to login to the web portal. For questions regarding the web portal or logging in, please contact Mathey Dearman Sales Department at [sales@mathey.com](mailto:sales@mathey.com) or +1-918-447-1288.

Once all fields are completed, click “Next”
6.2.16 Next, you must enter the CNC Machines serial number.
6.2.17 After you enter the serial number, click “register” and it will show how many activations are left.

NOTE: The Mathey CNC Saddle Machine comes with 2 software activations. For additional activations, please contact Mathey Dearman Sales Department at sales@mathey.com or +1-918-447-1288.
6.2.18 After the machine is listed in the table, click "next".
6.2.19 Once you get the screen below, click “Finish”.

6.2.20 If you click “Finish” and you are not connected to a Mathey CNC machine, you will get the following information screen pop up when the software opens.
6.3 Software Operation Basics

This section will take you through the basic features of the MatheyCNC software.

6.3.1 Shown below (Figure 6-4) is the splash screen. Once the software is launched after activation, this is the first screen you will see. The most important thing this screen communicates is the version of the software running. That information is shown at the bottom right portion of the screen. At this point the software is loading and may take several seconds to fully start up.

![Figure 6-4 MatheyCNC Splash Screen](image)

6.3.2 When the software is started for the first time the Language Select screen is shown (Figure 6-5). The default language is English. To change to a different language, click the dropdown and select the desired language. Once set, this can be changed at any time by going to the settings screen.

![Figure 6-5 Language Selection Screen (English)](image)

![Figure 6-6 Language Selection Screen (Portuguese)](image)
NOTE: For additional languages, please contact Mathey Dearman Technical Sales Department at sales@mathey.com or +1-918-447-1288.

6.3.3 The software will automatically recognize what size (model) CNC Saddle Machine it is connected to and adjust the selection parameters accordingly.

NOTE: The cuts that show up in the “List of Recent Cuts” as shown in the Cut Configuration Screen (Figure 6-10), are only for the size machine connected to. Example: If the software recognizes it is connected for a 1SA machine, where the pipe range is 3” to 8” NPS, the menus will reflect this range of pipe.
6.3.5 Cut Configuration Screen (Figure 6-10)

1. **Settings Screen** – Allows access to adjust the software settings and system default parameters.
2. **Selected Cut** – This recent cut is currently selected, it can be removed by right clicking on it or used by clicking the next button (6).
3. **Recently Used Cuts** – This is a list of all the recently set up cuts. A cut is added to this list whenever the cut wizard has been completed. Removing these cuts does not affect cuts that have been saved to the host machine hard drive. These recently used cuts can be modified by clicking the cut and press the next button (6).
4. **Create Sequential Cut** – This button will open up the sequential cut create/edit screen.
5. **Import Cut** – Previously saved MatheyCNC cut files (.MCNC) can be loaded using this button. Once an imported file has been loaded into the previously used cuts list it is saved and the original file can be deleted.
6. **Next Button** – If a previous cut is selected from the recently used cuts list (3) this button will proceed to the summary screen. From there the cut can be modified and saved to the computer.
7. **New Cut Button** – This button will go the cut selection screen where a new cut can be selected.
8. **Escape Button** – Clicking the X will close the MatheyCNC software.
6.3.6 Settings Screen (Figure 6-11)

1. **Help Button** – Open the help screen.
2. **Close** – This will close the settings screen and return to the cut configuration screen (6.23)
3. **Current Version** – This label shows the current version of the software.
4. **Cut Speed Maximum Allowable** – Highest allowable cut speed, when set the software will not allow the machine to move faster than this value in inches per minute. Range = 1 to 45
5. **Cut Speed Minimum Allowable** – Lowest allowable cut speed, when set the software will not allow the machine to move slower than this value in inches per minute. Range = 1 to 45
6. **Default Cut Speed** – All speed settings will default to this value in inches per minute. Range = 1 to 45
7. **Default Miter Angle** – The miter angle will default to this value when creating a miter cut in the cut wizard in degrees. Range = 10 to 85
8. **Branch Angle Maximum Allowable** – Highest allowable branch angle for saddle cuts and saddle hole cuts in degrees. Range = 10 to 170

9. **Branch Angle Minimum Allowable** – Lowest allowable branch angle for saddle cuts and saddle hole cuts in degrees. Range = 10 to 170 (must be smaller than Branch Angle Maximum)

10. **Lead In Length** – Default length for the lead in section of cuts in inches. Range = 0.1 to 2.0

11. **Lead Out Length** – Default length for the lead out section of cuts in inches. Range = 0.1 to 2.0

12. **Machine Z Travel Maximum** – This value is the true length of the lead screw arm in inches, this value is set when calibrating the machine. No cut can exceed this value in z width. To reset this value the machine must be recalibrated (11).

13. **Saddle Hole Kerf Outward Offset** – The size of the hole on saddle hole cuts will widened by this amount in inches. This value is only used when a saddle in type of saddle hole is selected. Range = 0.01 to 0.10

14. **Follow Though Length** – Amount of follow through to be automatically added to the end of the selected cut. This will insure that cut has been completed fully. Range = 1/16” to 1”

15. **Numeric System** – Chose which number system to use with the software. Imperial (inches) or Metric (centimeters).

16. **Calibrate machine** – This will calibrate the CNC machine if not already done so, if calibration has already been completed this will recalibrate the machine.

17. **Return Settings To Factory Defaults** – This button will return all the above settings to their respective default values.


19. **Save / Apply** – This will save all the above values, these settings will be saved with the software and will keep the values until they are saved over. If this screen is exited without pressing this button then the settings will not be saved. Once the settings have been successfully save the button will gray out and cannot be pressed.

20. **Check For Updates** – Once pressed the software will reach out to the remote server and check to see if there is a newer version of the Mathey CNC software. If the version that is being used is most recent a green check mark will appear. If no internet connection a no connection symbol will appear, internet connection is required to check for new updates. If a newer version of the CNC software is available then the auto update service will begin. (See Updating the Software Section)

21. **Language Select** – Press this button to change the language of the software.

22. **Close** – This will close the settings screen and return to the cut configuration screen (6.23)
Mathey Logo – Double click on Mathey Dearman icon in the settings screen while holding ‘Ctrl’ and ‘Shift’ on the keyboard you will see screen (Figure 6-12). This will allow you to change what size of cutter the machine will default too, if the laptop is not connected to a CNC machine. Once a laptop is connected to a CNC machine or the software is closed out completely, this value will be overwritten by the correct machine size.

Figure 6-12 Select CNC Machine Size Screen
6.3.7 Jog / Machine Info Screen (Figure 6-14)

1. Blue LED – When the green circle is lit, the blue light will be “on”.
2. Yellow LED – When the green circle is lit, the yellow light will be “on”.
3. Home Limit Switch – When the green circle is lit, the home limit switch is depressed.
4. End Limit Switch – When the green circle is lit, the end limit switch is depressed.
5. Start / Stop Button – When the green circle is lit, the Start / Stop button is depressed.
6. Plasma Control – When the green circle is lit, the relay controlling the plasma is functioning.
7. Extend Carriage – This button will extend the carriage along the leadscrew.
8. Counterclockwise Rotation – This button will rotate the CNC Saddle machine in a counterclockwise rotation.
9. Clockwise Rotation – This button will rotate the CNC Saddle machine in a clockwise rotation.
10. Retract Carriage – This button will retract the carriage along the leadscrew.
6.3.8 Sequential Cut Screen (Figure 6-14)

This screen is used to create and edit sequential cuts. Sequential cuts are combinations of previously created cuts that are all loaded into a single cut file to create a series of cuts executed in an order you specify.

**Figure 6-14 Sequential Cut Screen**

1. **Previous Cuts List** – These are all the previous cuts that have been created in the selected pipe diameter below (6). These previous cuts can be added using the ‘Add’ button (4) to the ‘New Sequential Cut’ list (2) to create a new sequential cut.

2. **New Sequential Cut List** – Cuts from the ‘Previous Cuts’ list (1) can be added to this list. Once this list is populated, a new sequential cut can be created using the ‘Save Sequential Cut’ button (12).

3. **Move Up Button** – When a cut is selected from the ‘New Sequential Cut’ list (2) this will move the selected individual cut(s) up or earlier in the cut sequence.

4. **Add Button** – This will add the selected cut from the ‘Recently Used Cut’ (1) list to the ‘New Sequential Cut’ (2). Adding a cut to this list will not affect the individual cut in any way and it can still be used as it was before.

5. **Remove Button** – This will remove the selected cut from the ‘New Sequential Cut’ (2) list. Removing a cut from this list will not affect the individual cut in any way and it can still be used as it was before.
6. **Pipe Diameter** – When the screen is loaded, all the sequential cuts are separated by the particular diameter that the cut is on. A sequential cut can only contain cuts for one specific pipe diameter. In order to view cuts from a different pipe diameter, click the dropdown and select the desired pipe size.

7. **Edit Sequential Cut** – When this button is pressed the 'Edit Sequential Cut' mode is activated. For more information see section 6.2.7

8. **File Name** – You must create a name for a sequential cut and enter it here before saving. This field cannot be left blank.

9. **Move Down Button** – When a cut is selected from the 'New Sequential Cut' list (2) this will move the selected individual cut(s) down or later in the cut sequence.

10. **Import cut** – Clicking this button opens up a dialogue box to allow you to import previously created individual cuts and sequential cuts. Once imported the previous cut will be added to the 'Previous Cut' list (1) assuming it is for the same pipe diameter currently selected.

11. **Notes** – You can create notes such as reminders or reference numbers. Notes can be associated with a particular sequential cut and saved with the cut sequence. This section can be left blank if desired.

12. **Save Sequential Cut** – This button will save the created cut that contains all added cuts in 'New Sequential Cut' list (2). **Note:** the software will not save the cut if the name is missing or the cut list is empty. Once a sequential cut is created the previous cuts that are a part of it are no longer associated with the cuts that created them. The old previous cuts can be deleted without affecting the created sequential cut. Once a cut is saved, the software will exit from this screen and the sequential cut will be added to the recent cut list of the cut configuration screen (See 0)
6.3.9 Edit Sequential Cut Screen (Figure 6-15)

Once the 'Edit Sequential Cut' button is selected from the Sequential Cut Screen (See 6.3.7) all created and imported sequential cuts are displayed in the 'Previous Cuts' list (Figure 6-14 Sequential Cut Screen). Now the 'Edit' button is displayed.

In order to edit a selected sequential cut from 'Previous Cuts' list, click the edit button (1). Once pressed the 'File Name', 'Notes' and 'Sequential Cut' Fields are populated with the data from the selected sequential cut and the screen enters the below state (Figure 6-16).

Cuts that can be added to the sequential cut being edited are on the left in the 'Previous Cuts' list. Cuts can be added and removed in the same fashion as creating a sequential cut. To save the edited sequential cut click the 'Save Sequential Cut' button (2). If anything has been changed it will save over the old sequential cut. If this screen is exited before the cut is saved then any changes that are made to the cut will not be saved.
Figure 6-16 Editing a Selected Sequential Cut

<table>
<thead>
<tr>
<th>Previous Cuts</th>
<th>Sequential Cut</th>
</tr>
</thead>
<tbody>
<tr>
<td>Saddle Hole Cut - 11/5/2013 10:45 AM</td>
<td></td>
</tr>
<tr>
<td>Miter Cut - 11/5/2013 10:45 AM</td>
<td></td>
</tr>
<tr>
<td>Straight Cut - 11/5/2013 9:55 AM</td>
<td></td>
</tr>
</tbody>
</table>

Pipe Diameter (Nominal): inches

File Name: Sequential Cut 1
6.3.10 Cut View Screen (Figure 6-17)

1. Cut Title Bar – The current cut type selected is displayed here (17).
2. Form Toolbar – Form tools and options are displayed here (18).
3. **Return To Configuration Button** – This will take the software back to the 'Cut Summary' screen.

4. **Minimize Button** – Clicking this will minimize the window.

5. **Maximize Button** – Clicking this will maximize the window.

6. **Exit Button** – Clicking this will close this screen and return to the 'Cut Configuration' screen.

7. **Iso View** – This button will orient the viewport so the pipe is view from the default Iso view.

8. **Top View** – This button will orient the viewport so the pipe is view from the default Top view.

9. **Right View** – This button will orient the viewport so the pipe is view from the default Right view.

10. **Left View** – This button will orient the viewport so the pipe is view from the default Left view.

11. **Bottom View** – This button will orient the viewport so the pipe is view from the default Bottom view.

12. **Front View** – This button will orient the viewport so the pipe is view from the default Front view.

13. **3-D Viewport** – This is the three dimensional viewport used to display the cut. The pipes and cut are displayed here and can be manipulated by clicking the buttons above.

14. **Zoom Window** – This allows the creation of a box in the viewport that will become the new zoom level.

15. **Zoom** – When selected this tool can be used to zoom in and out of the viewport.

16. **Pan** – This feature can be used to laterally move the viewport camera.

17. **Rotate** – This feature can be used to rotate the viewport camera in any direction.

18. **Zoom Fit** – When this button is selected the viewport will zoom out to expose the entire pipe and cut path.

19. **Reverse Cut Button** – When a configured cut has been paused, this button causes the torch to reverse on its cut path a distance of ½” (13 mm). The torch will travel back to this point and stop. The software will then wait for the next instruction. If the play button is clicked or the green button on the MCM is pressed, the cut will resume from this point.

20. **Play/Pause Button** – Pressing this button will signal the software to start the cut. Based on the state of the software this button will cause different actions:
    a. Cut stopped and machine not at the cut starting point (Play Icon):
        • The machine will go to the cut starting point and prompt the user to turn on the torch and start the cut.
    b. Cut stopped and machine at the starting point (Play Icon):
        • The software will prompt the user to turn on the torch and start the cut.
    c. Machine and software currently cutting (Pause Icon):
        • This will cause the machine and software to enter the paused state.
    d. Machine and software paused (Play Icon):
• The machine will go to the point at which the cut will start again and prompt the user to turn on the torch and start the cut.

21. **Cut Summary View** – This box shows a summary of all the settings for the current cut.

22. **Stop Button** – This button causes the torch to halt its movement at any point and the cut is reset. Once this button is pressed, any cut progress is ignored and the next press of the play button will cause the machine to go back to the original cut start point.

23. **Forward Cut Button** – When a cut is paused this button will cause the torch to go forward on its cut path a distance of ½” (13 mm). The torch will travel to this next point and wait for the next instruction. If the play button is pressed from this state the cut will resume from this point.

24. **Go Home Button** – This will send the torch back to the home position (0 degrees and .100 Inches). This position is determined by the calibration procedure.

25. **Speed Up Button** – Clicking this button will cause the selected cut speed to increase by 1 inch per minute. If the cut is currently running the speed at which the torch is moving will also increase by 1 inch per minute. This speed is limited by the size of the pipe (See Table 3-3) and minimum speed set (See 6.3.4 #2).

26. **Jog Carriage Forward Button** – This will cause the torch carriage to move forward or away from the ring gear until the button is depressed. There is a ¼ second deceleration associated with this jog button.

27. **Jog Rotate Counter Clockwise** – This will cause the ring gear to rotate counter clockwise from the perspective of facing the leadscrew assembly. There is a ¼ second deceleration associated with this jog button.

28. **Jog Carriage Clockwise** – This will cause the ring gear to rotate clockwise from the perspective of facing the leadscrew assembly. There is a ¼ second deceleration associated with this jog button.

29. **Jog Carriage Reverse Button** – This will cause the torch carriage to move backward or towards the ring gear until the button is released. There is a ¼ second deceleration associated with this jog button.

30. **Connection and Status Bar** – Displays machine connection status to the laptop computer and current state of the CNC Saddle Machine - (Ready, Paused, Cutting, or Stopped)

31. **Connection and Status Bar** – Displays machine information (Figure 6-19)

![Figure 6-19 Machine Information](image_url)

**Figure 6-19 Machine Information**

1. **Ring Gear Angle** – The current position of the ring gear (in degrees) from the home position set during calibration. Positive values are clockwise from the home position and negative values are counterclockwise from the home position.

2. **Carriage Position** – The current position of the torch carriage (in inches) on the Z-axis (axially on the pipe) from the home position. Home position is the point closest to the ring gear and is set during calibration. The normal home position is 0.10 inches.

3. **Torch Speed** – The current surface speed (inches per minute) of the torch in relation to the pipe.
32. Cut Information Bar – Displays cut information (Figure 6-20)

![CUT INFORMATION](image)

<table>
<thead>
<tr>
<th>Min Z</th>
<th>0.100 In</th>
<th>Z Width</th>
<th>3.414 In</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max Z</td>
<td>3.514 In</td>
<td>Cut Length</td>
<td>14.331 In</td>
</tr>
<tr>
<td>Start Point</td>
<td>(3.514, 0)</td>
<td>End Point</td>
<td>(1.424, 389.3)</td>
</tr>
</tbody>
</table>

**Figure 6-20 Cut Information**

1. **Min Z** – This is the closest point to the ring gear to which the torch will travel while executing the configured cut path. The smallest Z (axial distance, along the length of the pipe) value that exists in the cut path. This is the same value as the z-offset.
2. **Max Z** – This is the point furthest away from the ring gear to which the torch will travel while executing the configured cut path. The largest Z (axial distance, along the length of the pipe) value that exists in the cut path.
3. **Start Point** – The starting point of the cut, (carriage position in inches, ring gear position in degrees). This is the point where the torch will pierce the pipe when the cut is started.
4. **Time Left** – This is the estimated time that remains in the current configured cut. Time automatically updates when the torch cutting speed is changed.
5. **Z Width** – Total axial span of the cut path, measured lengthwise on the pipe.
6. **Cut Length** – Total length of torch cut path on the surface of the pipe.
7. **End Point** – The last point in the cut path. When the torch reaches this point the cut is complete.

33. **Speed Down Button** – Clicking this button once will cause the selected cutting speed to decrease by 1 inch per minute. If a configured cut is already running, the speed at which the torch is moving will also decrease by 1 inch per minute. This speed is limited by the size of the pipe (See Table 3) and minimum speed set (6.3.6 #2).

34. **Cut Progress** – Percentage of the currently running cut that has been completed.
6.3.11 Sequential Cut View Screen – (Figure 6-21)

Figure 6-21 Sequential Cut View Screen

1. **Full Cut Automation** – Checking this option will allow the software to automatically move from cut to cut in the sequential path. (In the example shown, once the play button is clicked for the first time and the ‘Straight Cut – 11/5/2013 9:55 AM’ is completed the software will move to the next cut ‘Saddle Cut – 11/5/2013 10:46 AM’ waiting the allotted time defined by the wait time between cuts (3).

2. **Full Cut Automation** – Checking this option will allow the software to automatically move from cut to cut in the sequential path. (I.E. once the play button is hit for the first time and the ‘Straight Cut – 11/5/2013 9:55 AM’ is completed the software will move to the next cut ‘Saddle Cut – 11/5/2013 10:46 AM’ waiting the allotted time defined by the wait time between cuts (3).

3. **Wait Time Between Cuts** – Clicking this item will bring up the wait time between cuts screen. See below. Clicking the ‘Save/Apply’ button will save this value (in seconds) in the software until it is changed again. This value will only be used if the ‘Full Cut Automation’ (1) is checked.
4. **Sequential Cut Viewport** – This viewport is structured in the same fashion as the normal viewport except it will show all of the cuts contained in this sequential cut. The cut highlighted in red is the cut that is currently selected cut. This can be changed by selecting a different value in the list of cuts (7).

5. **Set Current Cut** – Right clicking on the list of included cuts will allow the user to change which cut is selected as the current cut. See the ‘Current Cut’ section below for more information.

6. **Current Cut** – The cut that is bolded in this list is the current cut. The current cut is the specific current cut that the software is cutting at this particular moment. If the machine is stopped and no cut is being made the current cut corresponds to the next cut that will be made. The current cut can be changed to any cut whenever the machine is not making a cut. After the current cut has been completed the software will move on the next cut in the list. Once the last item on the list is completed the current cut will return back to the first value list and repeat the sequential cut.

7. **Currently Cutting Label** – Displays which cut is currently being cut or if the cut has not been started it shows what will be cut next along with the current status of the machine shown in the icon to the left.

   A. Below are all the different possible machine states.

   1. Before the cut.

      ![Ready: Miter Cut - 2/19/2014 9:33 AM](image)

   2. When the machine is moving to the first position.

      ![Going to the first position: Miter Cut - 2/19/2014 9:33 AM](image)

   3. Cutting

      ![Cutting: Miter Cut - 2/19/2014 9:33 AM](image)

   4.Paused

      ![Paused: Miter Cut - 2/19/2014 9:33 AM](image)
5. **Stopped**

8. **Sequential Cut Information Box** – This shows the same cut information that is displayed in the lower cut information box except this only pertains to the selected cut from the cut list box (7). The cut information for the entire sequential cut is located in the normal cut information box.

9. **Total Cut Completion Progress Bar** – This progress bar show the completion percentage of the entire sequential cut. When it reaches 100% the sequential cut has been completed.

10. **Current Cut Completion Progress Bar** – This progress bar show the completion amount of the current cut that is bolded in the list of cuts. When this progress bar is full the specific cut has been completed, and the bar will empty.
6.4 Calibrating the Mathey CNC Machine

6.4.1 Every time the Mathey CNC Machine is powered on, the machine must be calibrated. The MatheyCNC software will automatically prompt you to do this before a cut can be configured. To start the calibration, select ‘OK’ (1) from the pop up box below that appears.

![Calibration Start Screen](image)

**Figure 6-23 Calibration Start Screen**

6.4.2 The screen shown in Figure 6-24 shows the machine automatically running the carriage between the limit switches. First it will move to the Home Limit Switch as shown in Figure 6-24. Then it will move to the End Limit Switch as shown in Figure 6-25. The last step will move the carriage back towards the home limit switch as shown in Figure 6-26.

![Calibration Screen (Home Limit Switch)](image)

**Figure 6-24 Calibration Screen (Home Limit Switch)**
Figure 6-25 Calibration Screen (End Limit Switch)
Figure 6-26 Calibration Screen (Returning Home)
6.4.3 The next step in calibrating the CNC machine is to ensure the support rods are installed and adjusted correctly. This will ensure that the Ring Gear will properly enter the Saddle and Cap Ring cavity. Follow the on-screen instructions to achieve the proper alignment. (See Figure 6-27)

Adjust the support rods by turning the support bar clockwise and counterclockwise until the ring gear lines up with the opening in the saddle. Once each direction has been verified press the check mark below.

Figure 6-27 Support Rod Calibration Screen
6.4.4 The final step in the calibration process is to “zero” out the Ring Gear rotating the ring gear using the slow & fast rotate buttons in either direction until the bubble is centered in the bubble level on top of the carriage and leadscrew assembly. Once the bubble is centered in the level, click the Home button to complete the calibration process. (See Figure 6-28)

**Figure 6-28 Ring Gear Calibration Screen**

**NOTE:** When the bubble is centered in the level, the torch is directly on TDC (Top Dead Center).
6.5 Saving Cuts

6.5.1 Within the Mathey CNC software, the user has the ability to save cuts for future use on the current machine or to send to a different user location.

6.5.1.1 There are 2 methods for saving cuts.

6.5.1.2 The first method for saving a cut is from the Cut Review Screen. Click on the “Save Cut” button in the bottom right hand corner. (See Figure 6-29)

![Figure 6-29 Cut Review Screen (Save Cut)](image)

6.5.1.3 The second method to save a cut is from the Cut Review Screen. Click on the “Save Cut” button in the File menu in the top left hand corner of the cut Screen.

![Figure 6-30 File Save Cut Screen](image)
6.5.1.4 Next, browse to the desired file location in the navigation bar at the top of the screen, then name the file in the “File name:” line, last click the “Save” button. (See Figure 6-31)

![Figure 6-31 Save As Screen](image)

6.5.1.5 If the save was successful, you should see a message popup stating the cut was successfully exported. (See Figure 6-32)

![Figure 6-32 Save Successful Screen](image)
6.5.2 If a saved cut needs to be executed again or has been received from another user, start by clicking on the "Import Cut" button from the Cut Configuration Screen. (See Figure 6-33)
6.5.3 Browse to the file location where the saved cut file is located. (See Figure 6-34)

Figure 6-34 Saved Cut Open Screen (Browse to Folder)
6.5.4 Click on the saved cut file you wish to execute. (See Figure 6-42)
6.5.5 Click the “Open” button. (See Figure 6-36)

Figure 6-36 Saved Cut Open Screen (Click Open)

6.5.6 Once the saved cut file has been selected, continue to the Review Cut Screen (See Section 6.3.10).
6.6 Custom Cuts

6.6.1 When a cut falls outside the normal operation of the Mathey CNC software, the user can contact Mathey Dearman Technical Sales for assistance with a custom cut file. A user can provide a CAD file or sketch of a particular joint configuration and request a quote to produce a custom cut file.

6.6.2 A custom cut file will have a *.ccf file extension.

6.6.3 Open the software by clicking the "Mathey CNC" icon on the desktop. (See Figure 6-37)

Figure 6-37 Mathey CNC Desktop Icon

6.6.4 Click "New Cut" button. (See Figure 6-38)

Figure 6-38 Cut Configuration Screen
6.6.5 Click on “Custom Cut” button in the bottom right hand corner of the Cut Type Selection Screen. (See Figure 6-39)

![Cut Type Selection Screen](image)

*Figure 6-39 Cut Type Selection Screen*
6.6.6 Click on the “Select Custom Cut File” button. (See Figure 6-40)
6.6.7   Browse to the file location where the custom cut file is located. (See Figure 6-41)

Figure 6-41 Custom Cut Open Screen (Browse to Folder)
6.6.8 Click on the custom cut file you wish to execute. (See Figure 6-42)

Figure 6-42 Custom Cut Open Screen (Select File)
6.6.9 Click the “Open” button. (See Figure 6-43)

![Figure 6-43 Custom Cut Screen (Click Open)](image)

6.6.10 Once the custom cut file has been selected, continue to the Review Cut Screen (See Section 6.3.10).
6.7 Cut Screens

6.7.1 Pipe Diameter (Straight Cut, Miter Cut, Square Cuts Only) (Figure 6-44)

Figure 6-44 Pipe Diameter Cut Screen

1. **Standard Size Pipe Diameter Selection** – Select the nominal size of the pipe the machine is mounted on and cutting. Size choices are limited automatically to those within the range of the machine model being used (See Table 4).

2. **Custom Pipe Selection** – Select this radio button if the nominal size of the pipe the machine is mounted on and cutting is non-standard. Only one selection can be made at one time: Nominal or Custom. Size range is limited automatically to fall within the range of the machine model being used (See Table 4). **NOTE:** Cutting custom pipe diameters requires the use of custom spacer bolts. Contact Mathey Dearman sales for information at sales@mathey.com, +1(800) 725-7311 or +1(918) 447-1288

3. **Custom Pipe Size** – If the ‘Custom Pipe Diameter’ (2) radio button is selected this window will display the custom pipe diameter in inches. Values can be typed directly in this window.

4. **Down Button** – Decreases the value of the custom pipe diameter by one inch.

5. **Up Button** – Increases the value of the custom pipe diameter by one inch.

6. **Back Button** – Go to the previous cut selection screen.

7. **Next Button** – Go to the next cut selection screen.
6.7.2 Cut Speed (Figure 6-45)

**Figure 6-45 Cut Speed Screen**

1. **Up Button** – Increases torch cutting speed in one inch per minute increments. The maximum value is automatically limited by the 'Cut Speed Maximum Allowable' value in **Settings** and the value is displayed below [4]. (Figure 6-11 – [1])

2. **Default Cut Speed** – The window displays the initial default value for torch cutting speed in inches per minute. The value can be increased or decreased by clicking the Up Button (1) or Down Button (3). Once selected this value will be saved with the cut in the library. The value is limited by the 'Cut Speed Maximum & Minimum Allowable' value in **Settings** and is displayed below [4 & 5]. (Figure 6-11 – [1 & 2])

3. **Down Button** – Decreases torch cutting speed in one inch per minute increments. This value is limited by the 'Cut Speed Minimum Allowable' value in **Settings** and is displayed below [5]. (Figure 6-11 – [2])

4. **Minimum Speed Allowable** – The smallest value that can be selected for the default speed value. This value is limited by the 'Cut Speed Minimum Allowable' value in the settings. (Figure 6-11 – [2])

5. **Maximum Speed Allowable** – The largest value that can be selected for the default speed value. This value is limited by the 'Cut Speed Minimum Allowable' value in the settings. (Figure 6-11 – [2]) It is also limited by the relative maximum speed of the ring gear motor; these limits can be seen in (Table 3).

6. **Back Button** – Go to the previous cut selection screen.

7. **Next Button** – Go to the next cut selection screen.
6.7.3 Lead In or Lead Out (Figure 6-46)

Figure 6-46 Lead In or Lead Out Screen

1. **Lead In Toggle** – Click this icon to include a lead in to the cut path. Clicking the icon changes its color to orange. Including a lead in allows the pierce point and start of the cut to occur a selected distance off of the cut path. The length of this lead in (if included) will be the value defined in the box above (4). The direction of this lead in is defined by the work and drop settings for the cut (6.7.18). By default it is in the positive Z direction.

2. **Lead Out Toggle** – Click this icon to include a lead out from the cut path. Clicking the icon changes its color to orange. Including a lead out instructs the machine to move the torch away from the cut path a selected distance after the cut is complete. The length of this lead out (if included) will be the value defined in the box above (7). The direction of this lead out is defined by the work and drop settings of the cut (6.7.18). By default it is in the positive Z direction.

3. **Lead In Down Button** – Decrease the length of the lead in by one increment.

4. **Lead In Value** – Length of the lead in (in the z direction) in inches. The lead in length is limited by an internal minimum of 0.10 inches and a maximum of 2.00 inches.

5. **Lead In Up Button** – Increase the length of the lead in by one increment.

6. **Lead Out Down Button** – Decrease the length of the lead out by one increment.

7. **Lead Out Value** – Length of the lead out (in the z direction) in inches. The lead out length is limited by an internal minimum of 0.10 inches and a maximum of 2.00 inches.

8. **Lead Out Up Button** – Increase the length of the lead out by one increment.

9. **Back Button** – Go to the previous cut selection screen.

10. **Next Button** – Go to the next cut selection screen.
6.7.4  Miter Angle (Miter Cut Only) (Figure 6-47)

Figure 6-47 Miter Angle Screen

1. **Miter Angle Up Button** – Increases the angle of the miter angle by one increment. The maximum value is defined by an internal value.

2. **Miter Angle Value** – This is the value of the miter angle in degrees. The miter angle is defined in degrees from the zero position, or more simply, the angle away from a straight cut. A miter with a zero degree miter angle would be perpendicular (a right angle) to the centerline of the pipe and parallel to the end of the pipe. By default the angle tips away from the machine as the angle gets larger. Selecting a drop side cut instead of a work side cut reverses this orientation to an angle that tips back toward the base of the machine.

3. **Miter Angle Down Button** – Decreases the angle of the miter angle by one increment. The minimum value is defined by an internal value.

4. **Back Button** – Go to the previous cut selection screen.

5. **Next Button** – Go to the next cut selection screen.
6.7.5 Branch Angle (Saddle Cut Only) (Figure 6-48)

1. **Branch Angle Up Button** – Increases the angle of the branch intersection by one degree. The maximum value is determined in **Settings** - 'Branch Angle Maximum Allowable' (Figure 6-11 – [5])

2. **Branch Angle Value** – This is the value of the branch intersection angle in relation to the header (main) pipe, in degrees. Selecting a drop side cut as opposed to a work side cut reverses the cut direction.

3. **Branch Angle Down Button** – Decreases the angle of the branch angle by one degree. The minimum value is determined in **Settings** - 'Branch Angle Minimum Allowable' (Figure 6-11 – [6])

4. **Back Button** – Go to the previous cut selection screen.

5. **Next Button** – Go to the next cut selection screen.
6.7.6 Branch Angle (Saddle On Hole Only) (Figure 6-49)

**Figure 6-49 Branch Angle (Saddle On Hole Only) Screen**

1. **Branch Angle Up Button** – Raises the angle of the branch angle by one degree. The maximum value is determined in the settings 'Branch Angle Maximum Allowable' (Figure 6-11 – [5])

2. **Branch Angle Value** – This is the value of the branch angle or the intersection angle between the header pipe and the branch pipe in degrees. The branch angle is defined in degrees from the 90 degree position or more simply when the branch and header are perpendicular to one another. By default the angle tips the branch pipe more toward the positive z direction as the angle gets smaller, this can be reversed by selecting a drop side cut as opposed to work side cut. A branch angle of greater than 90 degrees will tip the branch pipe away from positive z direction.

3. **Branch Angle Down Button** – Lowers the angle of the branch angle by one degree. The minimum value is determined in the settings 'Branch Angle Minimum Allowable' (Figure 6-11 – [6])

4. **Back Button** – Go to the previous cut selection screen.

5. **Next Button** – Go to the next cut selection screen.
6.7.7 Centerline Offset (Saddle Hole Only) (Figure 6-50)

Figure 6-50 Centerline Offset (Saddle Hole Only) Screen

1. **Centerline Offset Up Button** – Raises the amount of centerline offset by one increment. The maximum value is limited by the size of the header pipe.

2. **Branch Angle Value** – Value of the offset of the branch pipe in relation to the header pipe in inches. This zero point of this value is defined when looking top down on the pipe and the branch pipe is equally spaced between the two sides. Raising the value of the centerline offset will move the branch pipe in the positive x direction when the positive z direction is facing the right. If looking top down with the machine on the pipe raising the value of the centerline offset will move the location of the branch pipe in the direction of the green button on the electrical box and vice versa.

3. **Branch Angle Down Button** – Lowers the amount of centerline offset by one increment. The minimum value is limited by the size of the header pipe.

4. **Back Button** – Go to the previous cut selection screen.

5. **Next Button** – Go to the next cut selection screen.
6.7.8 Centerline Offset (Saddle Cut Only) (Figure 6-51)

**Figure 6-51 Centerline Offset (Saddle Cut Only) Screen**

1. **Centerline Offset Up Button** – Raises the amount of centerline offset by one increment. The maximum value is limited by the size of the header pipe.
2. **Branch Angle Value** – Value of the offset of the branch pipe in relation to the header pipe in inches. The zero point of this value is defined when looking top down on the pipe and the branch pipe is equally spaced between the two sides. Raising the value of the centerline offset will move the branch pipe in the positive x direction when the positive z direction is facing the right. If looking top down with the machine on the pipe raising the value of the centerline offset will move the location of the branch pipe in the direction of the green button on the electrical box and vice versa.
3. **Branch Angle Down Button** – Lowers the amount of centerline offset by one increment. The minimum value is limited by the size of the header pipe.
4. **Back Button** – Go to the previous cut selection screen.
5. **Next Button** – Go to the next cut selection screen.
6.7.9 Centerline Offset (Square Hole Only) (Figure 6-52)

Figure 6-52 Centerline Offset (Square Hole Only) Screen

1. **Centerline Offset Up Button** – Raises the amount of centerline offset by one increment. The maximum value is limited by the size of the header pipe.

2. **Branch Angle Value** – Value of the offset of the branch pipe in relation to the header pipe in inches. The zero point of this value is defined when looking top down on the pipe and the branch pipe is equally spaced between the two sides. Raising the value of the centerline offset will move the branch pipe in the positive x direction when the positive z direction is facing the right. If looking top down with the machine on the pipe raising the value of the centerline offset will move the location of the branch pipe in the direction of the green button on the electrical box and vice versa.

3. **Branch Angle Down Button** – Lowers the amount of centerline offset by one increment. The minimum value is limited by the size of the header pipe.

4. **Back Button** – Go to the previous cut selection screen.

5. **Next Button** – Go to the next cut selection screen.
6.7.10 Custom Cut (Custom Cut Only) (Figure 6-53)

Figure 6-53 Custom Cut Screen

1. **File Name** – Name of the custom cut file (.ccf) file that was selected for use. This value is blank until a custom cut file is selected.
2. **Cut Name** – Cut name of the custom cut that was selected. This value is blank until a custom cut file is selected.
3. **Pipe Diameter** – Diameter of the cut from the custom cut that was selected. This value must be in the range of the CNC machine that is being used. (See Table 3-3) This value is blank until a custom cut file is selected.
4. **Select Custom Cut File Button** – Click this button to select a saved custom cut file from the host computer. Custom cuts are a predefined set of settings that must be provided from Mathey Dearman. To request a custom cut specific to one's needs contact Mathey Dearman.
5. **Back Button** – Go to the previous cut selection screen.
6. **Next Button** – Go to the next cut selection screen. The software will not advance past this screen until a custom cut file is selected.
6.7.11 Square Length (Square Hole Only) (Figure 6-54)

![Figure 6-54 Square Length (Square Hole Only) Screen]

1. **Square Length Up Button** – Increases the length of the square cut by one increment. The maximum value is limited by the length of the CNC machine arm. This value is defined when calibrating the machine.
2. **Square Length Value** – Value of the length of the square cut in the z direction in inches. This value by default starts at the zero position.
3. **Square Length Down Button** – Decreases the length of the square cut by one increment. The minimum value is limited by an internal value.
4. **Back Button** – Go to the previous cut selection screen.
5. **Next Button** – Go to the next cut selection screen.
6.7.12 Square Width (Square Hole Only) (Figure 6-55)

Figure 6-55 Square Width (Square Hole Only) Screen

1. **Square Width Up Button** – Increases the width of the square cut by one increment. The maximum value is limited by the diameter of the pipe being cut on.
2. **Square Width Value** – Value of the width of the square cut in the x direction in inches. This value by default starts at the zero position.
3. **Square Width Down Button** – Decreases the width of the square cut by one increment. The minimum value is limited by an internal value.
4. **Back Button** – Go to the previous cut selection screen.
5. **Next Button** – Go to the next cut selection screen.
6.7.13  Square Offset (Square Hole Only) (Figure 6-56)

Figure 6-56 Square Offset (Square Hole Only) Screen

1. **Square Offset Up Button** – Increases the overall length and width of the square cut by one increment. The maximum is defined by an internal value.
2. **Square Offset Value** – Amount to increase the overall length and width of the square cut in inches. This is useful when inserting a square pipe into the square hole, slag and other bits of cut pipe will restrict the size of the opening. This value is similar to 'Saddle Hole Kerf Outward Offset' (Figure 6-11 – [10]).
3. **Square Width Down Button** – Decreases the overall length and width of the square cut by one increment. The minimum value is zero.
4. **Back Button** – Go to the previous cut selection screen.
5. **Next Button** – Go to the next cut selection screen.
6.7.14   Header Pipe Diameter (Saddle and Saddle Hole Only) (Figure 6-57)

Figure 6-57 Header Pipe Diameter (Saddle and Saddle Hole Only) Screen

1. **Nominal Pipe Size Selection** – With this radio button checked only nominal pipe sizes can be selected from the list below (2)

2. **Standard Pipe Diameter Selection** – Select the nominal size of the pipe that the cut will occur on if a saddle hole or the size of the pipe that the branch will go into if a saddle cut. Pipe size is limited by the machine being used (See Table 3-3) if performing a saddle hole cut. If performing a saddle cut then the size of the pipe is limited by the internal diameter value.

3. **Custom Pipe Selection** – Select the custom size of the pipe that the cut will occur on if a saddle hole or the size of the pipe that the branch will go into if a saddle cut in inches. Only one selection can be made at one time: Nominal or Custom. Pipe size is limited by the machine being used (See Table 3-3) if performing a saddle hole cut. If performing a saddle cut then the size of the pipe is limited by the internal diameter value.

4. **Down Button** – Lower the selected value of the custom pipe diameter by one inch.

5. **Custom Pipe Size** – If the ‘Custom Pipe Diameter’ (2) radio button is selected this will be the custom pipe size actual diameter in inches.

6. **Up Button** – Raise the selected value of the custom pipe diameter by one inch.

7. **Back Button** – Go to the previous cut selection screen.

8. **Next Button** – Go to the next cut selection screen.
6.7.15  Header Pipe Thickness (Saddle In - Saddle Cut Only) (Figure 6-58)

Figure 6-58 Header Pipe Thickness (Saddle Cut Only) Screen

1. **Standard Pipe Thickness Selection** – With this radio button checked only standard pipe thicknesses can be selected from the list below (2)
2. **Standard Pipe Thickness Selection** – Select the standard thicknesses of the pipe that the branch will go into. Thickness is limited by the diameter of the pipe.
3. **Custom Pipe Selection** – Select the custom thicknesses of the pipe that the branch will go into in inches. Only one selection can be made at one time: Standard or Custom. Thickness is limited by the diameter of the pipe.
4. **Down Button** – Lower the selected value of the custom pipe thicknesses by one increment.
5. **Custom Pipe Size** – If the ‘Custom Pipe Thickness’ (2) radio button is selected this will be the custom pipe thicknesses in inches.
6. **Up Button** – Raise the selected value of the custom pipe thicknesses by one increment.
7. **Back Button** – Go to the previous cut selection screen.
8. **Next Button** – Go to the next cut selection screen.
6.7.16 Branch Pipe Diameter (Saddle and Saddle Hole Only) (Figure 6-59)

**Figure 6-59 Branch Pipe Diameter (Saddle and Saddle Hole Only) Screen**

1. **Nominal Pipe Size Selection** – With this radio button checked only nominal pipe sizes can be selected from the list below (2)

2. **Standard Pipe Diameter Selection** – Select the nominal size of the pipe that the cut will occur on if a saddle or the size of the branch that will go into if a saddle hole. Pipe size is limited by the machine being used (See Table 3-3).

3. **Custom Pipe Selection** – Select the custom size of the pipe that the cut will occur on if a saddle or the size of the branch that will go into the saddle hole in inches. Only one selection can be made at one time: Nominal or Custom. Pipe size is limited by the machine being used (See Table 3-3).

4. **Down Button** – Lower the selected value of the custom pipe diameter by one inch.

5. **Custom Pipe Size** – If the ‘Custom Pipe Diameter’ (2) radio button is selected this will be the custom pipe size in inches.

6. **Up Button** – Raise the selected value of the custom pipe diameter by one inch.

7. **Back Button** – Go to the previous cut selection screen.

8. **Next Button** – Go to the next cut selection screen.
6.7.17 Branch Pipe Thickness (Saddle and Saddle Hole Only) (Figure 6-60)

**Figure 6-60 Branch Pipe Thickness (Saddle and Saddle Hole Only) Screen**

1. **Standard Pipe Thickness Selection** – With this radio button checked only standard pipe thicknesses can be selected from the list below (2).
2. **Standard Pipe Thickness Selection** – Select the standard thicknesses of the branch pipe from the supplied list. Thickness is limited by the diameter of the pipe.
3. **Custom Pipe Selection** – Select the custom thicknesses of the branch in inches. Only one selection can be made at one time: Standard or Custom. Thickness is limited by the diameter of the pipe.
4. **Down Button** – Lower the selected value of the custom pipe thicknesses by one increment.
5. **Custom Pipe Size** – If the 'Custom Pipe Thickness' (2) radio button is selected this will be the custom pipe thicknesses in inches.
6. **Up Button** – Raise the selected value of the custom pipe thicknesses by one increment.
7. **Back Button** – Go to the previous cut selection screen.
8. **Next Button** – Go to the next cut selection screen.
6.7.18 Lead In / Out Work or Drop (Figure 6-61)

Figure 6-61 Lead In/Out – Work or Drop Screen

1. **“A” Selection** - This is the standard selection, the lead in/out will be in the positive z direction. The purpose of this option is for the pierce to be on the piece that is on the far side of the cutter.

2. **“B” Selection** - This is the standard selection, the lead in/out will be in the negative z direction. The purpose of this option is for the pierce to be on the piece the machine is resting on.

3. **Back Button** – Go to the previous cut selection screen.

4. **Next Button** – Go to the next cut selection screen.
6.7.19 Saddle ON or Saddle IN (Saddle Hole and Saddle Cut Only) (Figure 6-62)

**Figure 6-62 Saddle ON or Saddle IN (Saddle Hole and Saddle Cut Only) Screen**

1. **Saddle On Selection** – With this selected the branch will be cut to fit on the outside of the selected header pipe. The cut profile for the saddle and saddle hole cuts will be automatically adjusted to correctly fit the pipe dimensions.

2. **Saddle On Selection** – With this selected the branch will be cut to fit on the inside of the selected header pipe. The cut profile for the saddle and saddle hole cuts will be automatically adjusted to correctly fit the pipe dimensions.

3. **Back Button** – Go to the previous cut selection screen.

4. **Next Button** – Go to the next cut selection screen.
6.7.20 Clocking (Figure 6-63)

Figure 6-63 Clocking Screen

1. **Clocking Up Button** – Increases the clocking angle by 1 degree. Maximum value is limited by an internal value (270 degrees).
2. **Clocking Angle Value** – Angle to rotate the cut path about the z axis of the pipe. All cuts can be clocked or rotated around the pipe by specifying the amount of rotation in degrees.
3. **Clocking Down Button** – Decreases the clocking angle by 1 degree. Minimum value is limited by an internal value (-270 degrees).
4. **Go To Angle Button** – Clicking this button will cause the machine to rotate to the position indicated in the ‘clocking angle value’ (2) box.
5. **Set Clocking From Rotation Button** – If possible clicking this button will set the ‘clocking angle value’ box to be whatever the current ring gear angle is. This is useful whenever it is desired to set the starting position to a clocking value that is physically designated.
6. **Current Ring Gear Angle** – This label displays what the current ‘defined’ angle of the machine is. The zero point is defined during the calibration process but can be changed to the current location using the set home button (9).
7. **Jog Counter Clockwise Button** – Pressing this button will cause the machine to rotate in the counter clockwise direction in relation to the front of the machine. This direction is also in the negative domain of the clocking angle.
8. **Go Home Button** – This button will move the machine to the defined home zero point of the ring gear or zero degrees.
9. **Set Home Button** – This button will redefine the zero degree point of the ring gear, when pressed this will override the value set during calibration.

10. **Jog Clockwise Button** – Pressing this button will cause the machine to rotate in the clockwise direction in relation to the front of the machine. This direction is also in the positive domain of the clocking angle.

11. **Warning Label** – The purpose of this warning is to inform of the possibility that whenever a cut is complete the drop side of the cut may fall and damage the machine or user if not properly secured. If clocking is set to a position that starts on the lower half of the pipe then it will finish on the lower half of the pipe whenever the drop piece has been disconnected.

12. **Back Button** – Go to the previous cut selection screen.

13. **Next Button** – Go to the next cut selection screen.
6.7.21  Z-Offset (Straight Cut Only) (Figure 6-64)

1. **Smallest Possible Z-Offset** – This value is the smallest allowed z-offset and by default all cuts will have at least this amount of z-offset.

2. **Largest Possible Total Offset** – This value is the largest allowed z-offset value, the z-width plus the z offset cannot be larger than this value. This value is defined during calibration.

3. **Z-Offset Down Button** – Decrease the value of the z-offset by one decrement. This value is limited by minimum z offset (1).

4. **Z-Offset Value** – Value of the z-offset of the cut. The larger this number the further the cut will be away from the ring gear and the ring gear end of the arm.

5. **Z-Offset Up Button** – Increase the value of the z-offset by one increment. This value is limited by the length of the machine and the width of the cut.

6. **Jog Counter Clockwise Button** – Pressing this button will cause the machine to rotate in the counter clockwise direction in relation to the front of the machine. The indicator on the screen shows the current position of the ring gear.

7. **Jog Clockwise Button** – Pressing this button will cause the machine to rotate in the clockwise direction in relation to the front of the machine. The indicator on the screen shows the current position of the ring gear.

8. **Current Carriage Position** – Shows the current location of the carriage on the leadscrew in inches, it can be moved by using jog buttons (10 & 15)

9. **Current Ring Gear Angle** – Shows the current angle of the ring gear is in degrees, it can be moved by using rotate buttons (6 & 7)
10. **Jog Carriage Reverse Button** – Pressing this button will cause the machine to move the carriage in the reverse direction or in the –z direction. The current position of the ring gear is shown below (7).

11. **Move To Min** – Pressing this button will move the carriage to the current minimum z position. This location will be the smallest z value in the entire cut. This value is the same value that is in the z-offset label box (4).

12. **Go Home Button** – This button will move the machine to the defined home zero point of the carriage which is on the ring gear side and is also zero inches.

13. **Current Min Z Value** – Shows what the current minimum Z value is, this is updated whenever the 'Z-Offset Value' box (4) is changed.

14. **Set Z-Offset From Current Carriage Location Button** – If possible clicking this button will set the 'Z-Offset Value' box (4) to be whatever the carriage position is (8). This is useful whenever it is desired to set the starting position to a carriage position that is physically designated.

15. **Jog Carriage Forward Button** – Pressing this button will cause the machine to move the carriage in the forward direction or in the z direction. The current position of the ring gear is shown below (7).

16. **Back Button** – Go to the previous cut selection screen.

17. **Next Button** – Go to the next cut selection screen.
6.7.22  Z-Offset (Miter Cut, Saddle Cut Only) (Figure 6-65)

![Figure 6-65 Z-Offset (Miter Cut, Saddle Cut Only) Screen](image)

1. **Move To Max Button** – Pressing this button will move the carriage to the current maximum z position. This location will be the largest z value in the entire cut.

2. **Current Max Z Value** – Shows what the current maximum Z value is, this is updated whenever the ‘Z-Offset Value’ box (4) is changed and is based on the min z and width of the cut.
6.7.23  Z-Offset (Saddle Hole Cut, Square Hole Cut Only) (Figure 6-66)

Figure 6-66 Z-Offset (Saddle Hole Cut, Square Hole Cut Only) Screen

1. **Set Center Point From Current Carriage Location Button** – If possible clicking this button will set the ‘Z-Offset Value’ box (4) to the appropriate number to make the current carriage position be the center point of the saddle hole or square hole (8). This is useful whenever it is desired to set the center point to a carriage position that is physically designated.

2. **Move To Center Point Button** – Pressing this button will move the carriage to the current center point z position. This location is the projected center of the saddle hole or square hole.

3. **Current Center Point Z Value** – Shows what the current center point Z value is, this is updated whenever the ‘Z-Offset Value’ box (4) is changed and is based on the min z and half the width of the cut.
6.7.24 Summary Screen (Only buttons and icons applicable to the current cut are visible) (Figure 6-67)

Figure 6-67 Summary Screen

1. **Header Pipe Diameter Value / Pipe Diameter Value** – Value for header pipe diameter.
2. **Edit Head Pipe Diameter** - Takes the software back to the header pipe screen.
3. **Header Pipe Thickness Value** – Value for header pipe thickness.
4. **Branch Pipe Diameter Value / Square Length** - Value for branch pipe diameter.
5. **Edit Branch Pipe Diameter** - Takes the software back to the branch pipe diameter screen.
6. **Branch Pipe Thickness Value** – Value for branch pipe thickness.
7. **Branch Angle / Miter Angle / Square Width Value** – Value for Branch Angle / Miter Angle / Square Width Value.
8. **Edit Branch Angle / Miter Angle / Square Width** - Takes the software back to the Branch Angle / Miter Angle / Square Width screens.
9. **Lead In Value** – Value for lead in length.
10. **Edit Lead In** - Takes the software back to the lead in screen.
11. **Lead Out Value** – Value for lead out length.
12. **Edit Lead Out Value** - Takes the software back to the lead out screen.
13. **Z Offset Value** – Value for Z offset.
14. **Edit Z Offset Value** - Takes the software back to the Z offset screen.
15. **Clocking Value** – Value for clocking.
16. **Edit Clocking Value** - Takes the software back to the clocking screen.
17. **Centerline Offset Value** – Value for centerline offset.
18. **Edit Centerline Offset** - Takes the software back to the centerline offset screen.
19. **Edit Saddle On/Off** - Takes the software back to the saddle on/off screen.
20. **Cut Name** – The value used in this box will be the name of the cut when seen in the recently used cut screen. It can be changed at any time from this summary screen. When the finish button is pressed the cut is saved only to the recent cuts list using this name. It is possible to save the file to the host machine using a different name by clicking the 'Save Cut Button' (29).
21. **Notes** – Whatever text is included in this box will be attached to the previous cut and cut file data until it is written over. More information about current cut is useful to put in this spot.
22. **Cut Length** – The overall length of the cut in inches, this value is also displayed on the main cut screen.
23. **Z Width** – The overall width of the cut in inches, this value is also displayed on the main cut screen.
24. **Saddle In/Out** – Displays if the cut is a saddle on or saddle in if applicable.
25. **Min Z** – The smallest overall z value of the cut in inches, this value is also displayed on the main cut screen.
26. **Max Z** – The largest overall z value of the cut in inches, this value is also displayed on the main cut screen.
27. **Back Button** – Go to the previous cut selection screen.
28. **Finish Button** – Saves and finishes the cut, takes the software to the final and main cut view screen. From the next screen the cut can be started. To return to this screen click the ‘Return To Configuration Button’ on the main cut screen.
29. **Save Cut** – This button will bring up a box to allow the saving of the currently configured cut. Whenever a cut is saved it can be used on another computer or CNC machine.
6.7.25 Saddle ON or Saddle IN Hole Only (Figure 6-68)

Figure 6-68 Saddle ON or Saddle IN Hole Only Screen

1. **Through Hole Selection** – With this selected the branch pipe hole will be cut to fit on the inside of the selected header pipe. The cut profile for the saddle hole cuts will be automatically adjusted to correctly fit the pipe dimensions.

2. **True Hole Selection** – With this selected the branch pipe hole will be cut to fit on the outside of the selected header pipe. The cut profile for the saddle and saddle hole cuts will be automatically adjusted to correctly fit the pipe dimensions.

3. **Back Button** – Go to the previous cut selection screen.

4. **Next Button** – Go to the next cut selection screen.
6.7.26 Projected Hole Diameter (Saddle In / On Hole Only) (Figure 6-69)

Figure 6-69 Projected Hole Diameter (Saddle In / On Hole Only) Screen

1. **Standard Pipe Diameter Selection** – With this radio button checked only standard pipe thicknesses can be selected from the list below (2)
2. **Standard Pipe Diameter Selection** – Select the standard thicknesses of the branch pipe from the supplied list. Thickness is limited by the diameter of the pipe.
3. **Custom Pipe Selection** – Select the custom thicknesses of the branch in inches. Only one selection can be made at one time: Standard or Custom. Thickness is limited by the diameter of the pipe.
4. **Down Button** – Lower the selected value of the custom pipe diameter by one increment.
5. **Custom Pipe Size** – If the 'Custom Pipe Thickness' (2) radio button is selected this will be the custom pipe diameter in inches.
6. **Up Button** – Raise the selected value of the custom pipe diameter by one increment.
7. **Back Button** – Go to the previous cut selection screen.
8. **Next Button** – Go to the next cut selection screen.
6.7.27 True Hole Diameter (Saddle In / On Hole Only) (Figure 6-70)

Figure 6-70 True Hole Diameter (Saddle In / On Hole Only) Screen

1. **Standard Pipe Diameter Selection** – With this radio button checked only standard pipe thicknesses can be selected from the list below (2)

2. **Standard Pipe Diameter Selection** – Select the standard thicknesses of the branch pipe from the supplied list. Thickness is limited by the diameter of the pipe.

3. **Custom Pipe Selection** – Select the custom thicknesses of the branch in inches. Only one selection can be made at one time: Standard or Custom. Thickness is limited by the diameter of the pipe.

4. **Down Button** – Lower the selected value of the custom pipe diameter by one increment.

5. **Custom Pipe Size** – If the ‘Custom Pipe Thickness’ (2) radio button is selected this will be the custom pipe diameter in inches.

6. **Up Button** – Raise the selected value of the custom pipe diameter by one increment.

7. **Back Button** – Go to the previous cut selection screen.

8. **Next Button** – Go to the next cut selection screen.
6.7.28 Simple Square / Hole Selection Screen (Figure 6-71)

Figure 6-71 Simple Square / Hole Selection Screen

1. **Square Hole Selection** – With this selected a square will be cut on the outside of the header pipe.
2. **Simple Hole Selection** – With this selected a simple hole will be cut on the outside of the header pipe.
3. **Back Button** – Go to the previous cut selection screen.
4. **Next Button** – Go to the next cut selection screen.
6.7.29 Simple Hole Diameter (Simple Hole Only) (Figure 6-72)

Figure 6-72 Simple Hole Diameter (Simple Hole Only) Screen

1. **Simple Hole Size Up Button** – Increases the diameter of the simple hole cut by one increment. The maximum value is limited by the diameter of the pipe being cut on.
2. **Simple Hole Size Value** – Value of the diameter of the simple hole cut in the x direction in inches. This value by default starts at the zero position.
3. **Simple Hole Down Button** – Decreases the diameter of the simple hole cut by one increment. The minimum value is limited by an internal value.
4. **Back Button** – Go to the previous cut selection screen.
5. **Next Button** – Go to the next cut selection screen.
6.8 Updating the software

From time to time updates and improvements will be made to the software to help improve stability and usability. The MatheyCNC software has the ability to automatically detect if the version that is being run is not most recent and prompt to update to the newest version. If the software detects that there is a newer version available the pop up box below will appear.

![Upgrade Software Dialogue Box](Figure 6-73 Upgrade Software)

- To download and install the newest version press 'OK' (1)
  - This will trigger the software downloader to start downloading the latest version of the MatheyCNC software package (Figure 6-73).
  - If the file downloads correctly, a dialog box will popup notifying you the download is complete (Figure 6-73).
  - Once the MatheyCNC software has finished downloading then the MatheyCNC software will close and the installer will launch. This will run just like any other installer, and will automatically write over the old version.
  - Once the install wizard is complete, double click the desktop icon to start the software again.
- To cancel the upgrading process and continue using the current version press the 'Cancel' button (2)
  - Every time that the software is started it will prompt to upgrade to the newest version.
- The current version of MatheyCNC software installed can be seen in two places: (Figure 6-73)
  - At the bottom right of the splash screen when the MatheyCNC software is loading.
  - In the top right corner of the Settings screen.
Figure 6-74 Downloading Software

Figure 6-75 Download Complete

Figure 6-76 Software Version
7 Troubleshooting

7.7.1 During a cut if a problem occurs, in the “Help” pull down menu, select the “Send Technical Report” option. (See Figure 7-1)

![Figure 7-1 Help Menu](image)

**Figure 7-1 Help Menu**

*NOTE:* Wi-Fi must be enabled and connected before a report can be sent.

7.7.2 Once in the “Send Technical Report” screen, complete the “Issue Description” section and click the “Send Technical Report” button at the bottom. After this report is sent a Mathey Technical Representative will contact you within 24 hours. (See Figure 7-2)

![Figure 7-2 Send Technical Report Screen](image)
<table>
<thead>
<tr>
<th>Symptom</th>
<th>Possible Cause(s)</th>
<th>Corrective Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>No Red Light</td>
<td>No Electric Power</td>
<td>Plug into 115 or 230 power source</td>
</tr>
<tr>
<td></td>
<td>E Stop Switch is not released</td>
<td>Twist to release the E Stop Switch</td>
</tr>
<tr>
<td>No Blue Light</td>
<td>USB Cable is not connected.</td>
<td>Turn off power to machine, connect USB cable to Mathey CNC machine &amp; computer.</td>
</tr>
<tr>
<td></td>
<td>Software was opened before E Stop Switch was released.</td>
<td>Turn off software &amp; power to the machine. Turn on the machine first, then open</td>
</tr>
<tr>
<td></td>
<td></td>
<td>the software.</td>
</tr>
<tr>
<td>Machine hits End Limit Switch and stops.</td>
<td>The Yellow Power Cord has been severed.</td>
<td>Replace Yellow Power Cord and recalibrate.</td>
</tr>
<tr>
<td></td>
<td>Limit Switch has failed.</td>
<td>Replace limit switch and recalibrate.</td>
</tr>
<tr>
<td>Laptop cursor jumps around screen when</td>
<td>Plasma is emitting high frequency</td>
<td>Move laptop as far away from the CNC machine as possible. Ensure all plasma</td>
</tr>
<tr>
<td>plasma torch is fired</td>
<td></td>
<td>cables &amp; ground cables are not touching USB cable.</td>
</tr>
</tbody>
</table>
## Table 7-2 Mechanical Troubleshooting

<table>
<thead>
<tr>
<th>Symptom</th>
<th>Possible Cause(s)</th>
<th>Corrective Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Machine is cutting out of square</td>
<td>Incorrect Spacer Bolts</td>
<td>Use only Mathey Spacer Bolts designed for the pipe OD +/- 1/16”.</td>
</tr>
<tr>
<td></td>
<td>Machine is being used for cutting tubing or non-standard pipe</td>
<td>Contact Mathey Dearman Sales Department for custom Spacer Bolts</td>
</tr>
<tr>
<td></td>
<td>All four (4) Spacer Bolts are not in contact with pipe.</td>
<td>Reposition machine so that all four (4) Spacer Bolts contact the pipe and re-latch Boomer.</td>
</tr>
<tr>
<td></td>
<td>Leadscrew and Carriage Assembly is loose or not parallel with pipe</td>
<td>Check tightness of hex nuts, adjust support rod to bring assembly parallel to pipe surface – check in four (4) clock positions around pipe</td>
</tr>
<tr>
<td></td>
<td>Hoses or plasma lead binding.</td>
<td>Wrap the hoses or lead one (1) full turn around the pipe with enough slack to complete 1 revolution of the pipe.</td>
</tr>
<tr>
<td></td>
<td>Machine has been dropped.</td>
<td>Send the machine to a certified repair station for evaluation and repair</td>
</tr>
<tr>
<td></td>
<td>Torch is at end of Leadscrew and Carriage Assembly.</td>
<td>Move the Torch closer to the Ring Gear.</td>
</tr>
<tr>
<td></td>
<td>Pinion Gears have shallow engagement with Ring Gear.</td>
<td>Readjust the Bearing Brackets so the Pinion Gears have proper engagement per the repair instructions.</td>
</tr>
<tr>
<td></td>
<td>Torch tip contacting the pipe at the 6:00 position</td>
<td>Pipe is out of round or oversize.</td>
</tr>
<tr>
<td></td>
<td>Torch tip is further away from the pipe at the 6:00 position</td>
<td>Pipe is out of round or undersize.</td>
</tr>
<tr>
<td></td>
<td>The timing of the Pinion Gears to the Ring Gear is out of adjustment.</td>
<td>Readjust the timing per the repair instructions.</td>
</tr>
<tr>
<td></td>
<td>Support Rods are not calibrated properly.</td>
<td>Readjust Support Rods to reduce the amount of friction between the Ring Gear and the Saddle or Cap Ring faces.</td>
</tr>
<tr>
<td></td>
<td>The Drive Chain is worn or out of adjustment.</td>
<td>Readjust the Bearing Brackets to eliminate the slack in the Chain per the repair instructions. If the slack cannot be eliminated replace the Drive Chain.</td>
</tr>
</tbody>
</table>
8 Maintenance

Note on Maintenance:
This parts and operating manual contains information concerning periodic maintenance, lubrication and minor repairs. Only an experienced electronics technician should attempt the repair of the Machine Control Module or electrical system of the CNC Saddle Machine. It is strongly recommended that the CNC Saddle Machine be sent to an authorized Mathey Dearman Certified Repair Center for repair.

In order to obtain the maximum life of the CNC Saddle machine, maintenance should only be performed by an authorized Mathey Dearman Certified Repair Center. The Mathey Dearman CNC Saddle Machine requires only minimal maintenance; however, these are precision machines. In order to achieve proper results, make sure the machine is handled with reasonable care and is kept clean and lubricated. The machine should be stored in the Mathey Dearman CNC Machine Storage Container during transportation and when not in use.

Failure to send the Mathey Dearman CNC Saddle Machine in the provided storage case for repairs will void the warranty.

If the Machine is under warranty contact Mathey Dearman before attempting any repair. Failure to contact Mathey Dearman prior to attempting repairs will void the warranty.

- It is important the Ring Gear, Pinion Gears, and Drive Chains be kept clear of cutting slag and debris, especially sand and dirt.
- When used on a daily basis, the Saddle, Ring Gear, Cap Ring, and Leadscrew should be cleaned and the Ring Gear Track Surfaces and Leadscrew should be coated with Lubriplate 130-AA or equal lubricant after each 8 hours of operation. Note: The Torch Carriage Beams should be wiped clean with a dry rag at the same interval but do not require lubrication.
- When used on an intermittent basis, the Saddle, Ring Gear, Cap Ring, and Leadscrew should be cleaned and the Ring Gear Track Surfaces and Leadscrew should be coated with Lubriplate 130-AA or equal lubricant after each 8 hours of operation. Note: The Torch Carriage Beams should be wiped clean with a dry rag at the same interval but do not require lubrication.
- The Drive Chains and Sprockets should be cleaned regularly and coated with a film of a light oil or lubricant such as WD-40 or equal.
- The bearings of the 1SA and 2SA Single Bearing Bracket and the Double Bearing Bracket Assembly are sealed and should never require additional lubrication.
- The bushings in the MSA Single Bearing Bracket and the Double Bearing Bracket Assembly should be greased with a multi-purpose grease weekly.
- Please contact Mathey Dearman at 918-447-1288, or by email at sales@mathey.com if you have any questions concerning maintenance not covered in this manual.
8.1 Replacement of the Drive Chain or Timing the MSA Ring Gear to the Pinion Gears

8.1.1 Remove the 2 5/16-18 Hex Nuts (Figure 1 Item 9) from the threaded studs that hold the Leadscrew Carriage Assembly (Figure 5) to the face of the Ring Gear.

8.1.2 Remove the Leadscrew Carriage Assembly (Figure 5) from the studs located on the Ring Gear.

8.1.3 Remove 2 of the 1/4-20 X ½ lg. Button Head Cap Screws (Figure 2 Item 11) from the face of the MSA Ring Gear Cover (Figure 2 Item 8).

8.1.4 Remove 4 of the 1/4-20 X 1/2" lg. Button Head Cap Screws (Figure 2 Item 11) from the back of the MSA Ring Gear Cover (Figure 2 Item 8) that holds the cover to the Back Motor Bracket (Figure 2 Item 6).

8.1.5 Loosen Setscrews in the crank pinion side of the K Coupling (Figure 2 Item 9).

8.1.6 Remove 2 of the 1/4-20 X 1" lg. Hex Head Cap Screws (Figure 2 Item 1) from the face of the MSA Standoff Bracket (Figure 2 Item 3) that holds the MSA Standoff (Figure 2 Item 10) to the MSA Standoff Bracket.

8.1.7 While holding the Back Motor Bracket (Figure 2 Item 6) and Control System Assembly (Figure 6), slide the K Coupling off the shaft of the Crank Pinion.

8.1.8 Remove 2 of the 1/4-20 X ½ lg. Hex Head Cap Screws (Figure 2 Item 1) located in the backside of the Single and Double bearing brackets and remove MSA Standoff Bracket (Figure 2 Item 3).

8.1.9 Install the Crank Handle onto the Crank Pinion of the Double Bearing Bracket.

8.1.10 Follow the instructions in the MSA Parts and Operating for retiming of the Pinion Gear to the Ring Gear or replacement of the drive chain of a manual MSA Saddle Machine.

8.2 Replacement of the Drive Chain or Timing the 1SA Ring Gear to the Pinion Gears

8.2.1 Remove the 2 5/16-18 Hex Nuts (Figure 1 Item 9) from the threaded studs that hold the Leadscrew Carriage Assembly (Figure 5) to the face of the Ring Gear.

8.2.2 Remove the Leadscrew Carriage Assembly (Figure 5) from the studs located on the Ring Gear.

8.2.3 Remove 2 of the 1/4-20 X ½ lg. Button Head Cap Screws (Figure 3 Item 13) from the face of the 1SA Ring Gear Cover (Figure 3 Item 11).

8.2.4 Remove 4 of the 1/4-20 X 1/2" lg. Button Head Cap Screws (Figure 3 Item 13) from the back of the 1SA Ring Gear Cover (Figure 3 Item 11) that holds the cover to the Back Motor Bracket (Figure 3 Item 8).

8.2.5 Loosen Setscrews in the crank pinion side of the K Coupling (Figure 3 Item 10).

8.2.6 Remove 2 of the 1/4-20 X 1" lg. Hex Head Cap Screws (Figure 3 Item 2) from the face of the 1SA Standoff Bracket (Figure 3 Item 1) that holds the 1SA Rear Standoff (Figure 3 Item 10) to the 1SA Standoff Bracket.

8.2.7 While holding the Back Motor Mounting Bracket (Figure 3 Item 8) and Control System Assembly (Figure 6), slide the K Coupling off the shaft of the Crank Pinion.

8.2.8 Remove 2 of the 1/4-20 X ½ lg. Hex Head Cap Screws (Figure 2 Item 11) located in the backside of the Single and Double Bearing Bracket and remove MSA Standoff Bracket (Figure 2 Item 3).

8.2.9 Install the Crank Handle onto the Crank Pinion of the Double Bearing Bracket.
8.2.11 Follow the instructions in the 1SA Parts and Operating for retiming of the Pinion Gear to the Ring Gear or replacement of the drive chain of a manual 1SA Saddle Machine.

8.3 Replacement of the Drive Chain or Timing the 2SA Ring Gear to the Pinion Gears

8.3.1 Remove the 2 5/16-18 Hex Nuts (Figure 1 Item 9) from the threaded studs that hold the Leadscrew Carriage Assembly (Figure 5) to the face of the Ring Gear.

8.3.2 Remove the Leadscrew Carriage Assembly (Figure 5) from the studs located on the Ring Gear.

8.3.3 Remove 2 of the 1/4-20 X ½ lg. Button Head Cap Screws (Figure 4 Item 14) from the face of the 2SA Ring Gear Cover (Figure 4 Item 13).

8.3.4 Remove 4 of the 1/4-20 X 1/2" lg. Button Head Cap Screws (Figure 4 Item 14) from the back of the 2SA Ring Gear Cover (Figure 4 Item 13) that holds the cover to the Back Motor Bracket (Figure 4 Item 8).

8.3.5 Loosen Setscrews in the crank pinion side of the K Coupling (Figure 4 Item 11).

8.3.6 Remove 2 of the 1/4-20 X 1” lg. Hex Head Cap Screws (Figure 4 Item 1) from the face of the 2SA Standoff Bracket (Figure 4 Item 3) that holds the 1SA Rear Standoff (Figure 4 Item 10) to the 2SA Standoff Bracket.

8.3.7 While holding the Back Motor Mounting Bracket (Figure 4 Item 8) and Control System Assembly (Figure 6), slide the K Coupling (Figure 4 Item 11) off the shaft of the Crank Pinion.

8.3.8 Remove the 3/8-16 x 1” lg. Hex Head Cap Screws (Figure 4 Item 5) and 3/8-16 Hex Nut (Figure 4 Item 6) that holds the 2SA Standoff Bracket (Figure 4 Item 3) to the Single Bearing Bracket Assembly (Figure 4 Item 9).

8.3.9 Remove the 3/8-16 x 1” lg. Hex Head Cap Screws (Figure 4 Item 5) located in the backside of the Double Bearing Bracket and the Cover Threaded (Figure 4 Item 9) and remove 2SA Standoff Bracket (Figure 4 Item 3).

8.3.10 Install the Crank Handle onto the Crank Pinion of the Double Bearing Bracket.

8.3.11 Follow the instructions in the 2SA Parts and Operating for retiming of the Pinion Gear to the Ring Gear or replacement of the drive chain.

8.4 Disassembly and Repair of the Single and Double Bearing Bracket Assemblies.

Contact Mathey Dearman for instructions, if disassembly and repair of the Single and Double Bearing Bracket Assemblies is required.

8.5 Storage

8.5.1 If the machine will not be used for a period of the time, the machine should be cleaned and re-greased with Lubriplate 130-AA.

8.5.2 If the machine is stored for a period of more than 2 weeks, the machine should be cleaned and re-greased with Lubriplate 130-AA.

8.5.3 The CNC Saddle Machine should be stored in its storage box in a clean and dry place protected from damage.
9  Warranty
For Information concerning product warranty, please visit www.mathey.com.
10 Index of Figures

Figure 2-1 CNC Saddle Machine Storage Case and Contents ............................................................................................................. 10
Figure 4-1 MSA CNC Saddle Machine Component Assembly (Part# 03-0117-003) ............................................................................. 14
Figure 4-2 1SA CNC Saddle Machine Component Assembly (Part# 03-0117-004) ................................................................. 16
Figure 4-3 2SA CNC Saddle Machine Component Assembly (Part# 03-0117-005) ................................................................. 18
Figure 4-4 Leadscrew and Carriage Assembly (Part# 03-0117-001) .......................................................................................... 20
Figure 4-5 Machine Control Module (MCM) Assembly (Part# 03-0117-002) ............................................................................. 22
Figure 5-1 Spacer Bolt Storage Box ........................................................................................................................................... 24
Figure 5-2 Installation of Spacer Bolt ........................................................................................................................................... 24
Figure 5-3 MSA Spacer Bolt Installation ....................................................................................................................................... 25
Figure 5-4 1SA / 2SA Spring Boomer Latch Assembly ............................................................................................................. 25
Figure 5-5 1SA / 2SA Spring Boomer Latch Installation ............................................................................................................. 26
Figure 5-6 MSA Boomer Assembly Installation .................................................................................................................. 26
Figure 5-7 CNC Saddle Machine Component Assembly ................................................................................................. 27
Figure 5-8 Mounting the Leadscrew Assembly .................................................................................................................. 28
Figure 5-9 Swivel Stud to Ring Gear Diagram .................................................................................................................. 28
Figure 5-10 Support Bar to Leadscrew Assembly .................................................................................................................. 29
Figure 5-11 Swivel Stud to Support Bar Assembly .................................................................................................................. 30
Figure 5-12 CNC Saddle Machine Components and Connections .......................................................................................... 31
Figure 5-13 Cut Configuration Screen ....................................................................................................................................... 32
Figure 5-14 Settings Screen .................................................................................................................................................. 32
Figure 5-15 Jog/Machine Info Screen ........................................................................................................................................ 33
Figure 6-1 Mathey Dearman USB flash drive .................................................................................................................. 34
Figure 6-2 Contents of the Mathey Dearman USB flash drive .................................................................................................. 36
Figure 6-3 MatheyCNC Desktop Icon ........................................................................................................................................ 37
Figure 6-4 MatheyCNC Splash Screen ........................................................................................................................................ 52
Figure 6-5 Language Selection Screen (English) .................................................................................................................. 52
Figure 6-6 Language Selection Screen (Portuguese) .................................................................................................................. 52
Figure 6-7 Language Selection Screen (Spanish) .................................................................................................................. 53
Figure 6-8 Language Selection Screen (French) .................................................................................................................. 53
Figure 6-9 Language Selection Screen (Russian) .................................................................................................................. 53
Figure 6-10 Cut Configuration Screen ....................................................................................................................................... 54
Figure 6-11 Settings Screen .................................................................................................................................................. 55
Figure 6-12 Select CNC Machine Size Screen .................................................................................................................. 57
Figure 6-13 Jog / Machine Info Screen ........................................................................................................................................ 58
Figure 6-14 Sequential Cut Screen ............................................................................................................................................... 59
Figure 6-15 Edit Sequential Cut Screen ....................................................................................................................................... 61
Figure 6-16 Editing a Selected Sequential Cut .................................................................................................................. 62
Figure 6-17 Cut View ........................................................................................................................................................ 63
Figure 6-18 Cut View Screen Form Toolbar .................................................................................................................. 64
Figure 6-19 Machine Information ............................................................................................................................................... 65
Figure 6-20 Cut Information .................................................................................................................................................. 66
Figure 6-21 Sequential Cut View Screen ....................................................................................................................................... 67
Figure 6-22 Wait Time between Cuts Screen .................................................................................................................. 68
Figure 6-23 Calibration Start Screen ............................................................................................................................................... 70
Figure 6-24 Calibration Screen (Home Limit Switch) ............................................................................................................. 70
Figure 6-25 Calibration Screen (End Limit Switch) .................................................................................................................. 71
Figure 6-26 Calibration Screen (Returning Home) .................................................................................................................. 72
Figure 6-27 Support Rod Calibration Screen .................................................................................................................. 73
Figure 6-28 Ring Gear Calibration Screen .................................................................................................................. 74
Figure 6-29 Cut Review Screen (Save Cut) ....................................................................................................................................... 75
Figure 6-30 File Save Cut Screen ............................................................................................................................................... 75
Figure 6-31 Save As Screen .................................................................................................................................................. 76
Figure 6-32 Save Successful Screen ............................................................................................................................................... 76
Figure 6-33 Cut Configuration Screen (Import Cut) .................................................................................................................. 77
Figure 6-34 Saved Cut Open Screen (Browse to Folder) .................................................................................................................. 78
11 Index of Tables
Table 2-1 CNC Saddle Machine Contents............................................................................................................................................ 10
Table 3-1 CNC Saddle Machine General Specifications................................................................................................................ 11
Table 3-2 Maximum Cutting Speeds per Pipe Size.................................................................................................................................... 12
Table 3-3 Cutting Capability – Pipe Sizes by Model ............................................................................................................................ 12
Table 3-4 Cutting Capability – Maximum Miter Angles ....................................................................................................................... 13
Table 3-5 Cutting Capability – Maximum Saddle Angles................................................................................................................ 13
Table 4-1 MSA CNC Saddle Machine Component Assembly Parts Identification ......................................................................................... 15
Table 4-2 1SA CNC Saddle Machine Component Assembly Parts Identification .................................................................................. 16
Table 4-3 2SA Saddle Machine Component Assembly Parts Identification ............................................................................................ 16
Table 4-4 Leadscrew and Carriage Assembly Parts Identification ........................................................................................................ 21
Table 4-5 Machine Control Module (MCM) Parts Identification ........................................................................................................... 23
Table 7-1 Electronic Troubleshooting .............................................................................................................................................. 122
Table 7-2 Mechanical Troubleshooting ........................................................................................................................................ 123