## SEWING MACHINE
**MOBILE HAND HELD SEWING MACHINE**

<table>
<thead>
<tr>
<th>Item Number</th>
<th>Number of items</th>
<th>Item name</th>
<th>Checked OUT</th>
<th>Checked IN</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
<td>Sewing Machine</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>1</td>
<td>Case</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>1</td>
<td>Documentation (13 pages)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

This equipment has received an in-service inspection and was found to have no obvious defects.

**CHECKED OUT BY**

Name: __________________________ Signature: __________________________

**Comments: __________________________**

---

**Dear Customer**

On receipt of this equipment, please check all equipment has been received, ensure your site staff read and understand the operating, maintenance and safety information, and use the equipment in a safe manner.

- You are responsible for the safe operation of the equipment and the safety of your staff.

- Standard Occupational, Health and Safety guidelines should be followed as per normal site operations. Site safety and safe work practices are your responsibility.

- At the conclusion of the use of the equipment, please clean the equipment, repack it for transportation and return to Geofabrics.

- Please advise if there are any missing parts. All equipment usage must be in accordance with Geofabrics’ Hire Agreement. You will be charged for any damaged or missing components.
SEWING MACHINE – OPERATING AND SAFETY INSTRUCTIONS

WARNING!

- Any alterations to this hire equipment may prove dangerous to the operator and will be in breach of the Equipment Hire Agreement.

- Service must only be performed by an authorised Geofabrics service organisation or representative.

- Please contact Geofabrics (0800 60 60 20) for return of this equipment or servicing if it is found to be faulty.

- All hire related documentation, operating and safety instructions are available on our website (www.geofabrics.co.nz).

The Geofabrics Sewing Machines are used to achieve a high quality field seam when geotextile panels are required to be sewn together on-site.

Pre-operational considerations

- Before operating the Sewing Machine, it is important that you read and understand the maintenance and safety precautions outlined below and in the Equipment Hire Agreement document (Use and Maintenance).

- Contact Geofabrics (0800 60 60 20) if you do not understand any of the instructions in this document.

- To operate the Sewing Machine, operators must be in good physical and mental condition. Do not operate if on medication or under the influence of alcohol or drugs. Seek medical advice if unsure.

- As the installation of Geofabrics products is considered a construction activity, the contractor using the hire equipment must prepare a site safety plan that incorporates the safe work methods for high risk work involving the Sewing Machine.
Safety Precautions

- **Never** operate or work in the vicinity of a tool in use without eye protection that provides protection against flying particles both from the **front** and **side**. Eye protection is required to guard against potential flying needle shards and debris, which could cause severe eye injury. The employer and/or user must ensure that proper eye protection is worn. Eye protection equipment must conform to the requirements of the relevant NZ Safety Standards and provide frontal and side protection.

**Warning**  
Eye protection equipment must provide both frontal and side protection.

- Always use appropriate personal protective equipment such as riggers gloves, high visibility clothing (shirt or tabard), hard hats, steel capped safety boots, safety eye wear with side protectors, etc.

- Only properly trained personnel are permitted to operate the Sewing Machine.

- **Never** use the machine without safety devices. All safety devices must be in position when the machine is ready for work or when in use.

- **Never** engage in horseplay with the tool. **It is not a toy.**

- **Never** tamper with, disable or remove the safety device.

- **Never** leave the work area for any extended period of time without disconnecting the tool from the electricity.

- **Never** attempt to clear a jam without disconnecting the tool from electricity and removing the remaining fasteners from the tool.

- **Never** operate a dirty tool. Clean the tool at least daily and lubricate if required.

- For detailed information on the machine use, maintenance and threading instructions, refer to the Sewing machine manual.

- Danger points are marked with the triangular warning symbols.

**Warning**  
Keep fingers clear of all moving parts of the tool.

- Only use thread that is recommended by Geofabrics, as there are standard strength and fibre requirements, to meet specifications.

- Keep the Sewing Machine clean and dry.

- Do not use the Sewing machine for any application other than its intended purpose.
• Do not abuse the Sewing Machine in any way which may result in personal injury and/or damage to the equipment. Treat the machine with respect and it will perform safely and reliably for you.

• Exercise caution not to drop the Sewing Machine.

• Check the condition of the Sewing Machine before each use for any damage. If the behaviour of the Sewing machine changes, check it immediately and return it to Geofabrics for service if necessary.

**Warning** The following operations must not be performed until the machine has been disconnected from its power supply by turning-off the main switch or by pulling out the main plug.

1. Threading needle(s), looper, spreader etc.
2. Replacing sewing tools such as needle, presser foot, throat plate, looper, spreader, feed dog, needle guard, folder, fabric guide etc.
3. Leaving the work place unattended.
4. Maintenance work

• Never attempt to service or modify the equipment in any way.

**Site Conditions**

• The Sewing Machine is designed for the application of geotextile products to suitable construction site areas. The Sewing Machine should not be operated in conditions which could endanger the operator or other site personnel.

**Working Techniques and Operation**

• Before leaving our store, each machine is carefully inspected, adjusted and given a sewing test. However, upon receipt, the machine should be inspected, and any damage or complaints should be reported to Geofabrics without delay.

• Unpack the machine. Make sure that no pieces of packing are trapped in the mechanism.

• Check by turning the motor hand wheel in operating direction (see Operating Instructions Picture 1) if the machine works. A slight resistance will be felt as the feed dog rises.

• Loosen screw A (see Operating Instructions Picture 2) and set thread rod B so that its lower end is flush with the underside of thread cone support C. Retighten screw A.

• Check the threading of the machine. See Threading Diagram Picture 3, and refer to the following Threading instructions:

**Threading - Pull Out Mains Plug Before Threading!**

• Loosen thumb screw(s) D (see Threading Diagram Picture 2) in the thread cone support, pull out the spool pin(s) E and remove the empty thread cone(s).

• Insert the new thread cone(s) with spool pin(s) E and retighten thumb screw D.

• Thread the machine as shown in Threading Diagram Picture 3.
• For threading the needle, turn motor hand wheel in operating direction until the needle is in its upmost position above the throat plate.

• For threading the looper (double locked stitch machines only) open the hinged cover A (see Threading Diagram Picture 4) and turn motor hand wheel in operating direction until the needle is in its lowest position below the throat plate. Reclose hinged cover A after threading.

**Thread Tension**

• The tension L (see Threading Diagram Picture 4) controls the looper thread and the tension N controls the needle thread.

• Only a slight tension should be applied on the looper thread.

• The tension applied on the needle thread depends upon the size of the thread and the thickness of the fabric to be sewn and has to be regulated till the machine sews and chains off perfectly.

**Changing The Needle - Pull Out Mains Plug Before Changing the Needle!**

• Turn motor hand wheel in operating direction until the needle is in its upmost position above the throat plate. Unthread the eye of the needle.

• Loosen the screw D (see Threading Diagram Picture 4) for the needle and draw out the needle. Insert the shank of the new needle as far as it will go into the needle seat and with the flat on the shank facing to the front.

• Retighten screw D for the needle on the flat of the needle shank and thread the needle eye.

**Oiling - Pull Out Mains Plug Before Oiling!**

• The machine has to be oiled at least once a day on the oil spots 1 – 11 shown in the Oiling Diagram Picture 5.

• Oiling spots 1, 2 and 3 is especially important.

• Recommended oil : Mobil D.T.E, Oil Medium

**Cleaning**

• Clean the machine periodically from lint, dust and sand. For this also open hinged cover A (see Threading Diagram Picture 4) and the punched cover B (see Oiling Diagram Picture 6)

• Reclose covers.

• Regularly blow out dust and sand particles with an air compressor.

• When working in coastal areas, daily spray the machine with a light lubricant: e.g. CRC.

**Maintenance**

• All routine maintenance and repairs shall be carried out by Geofabrics or its authorised repairer, to ensure the equipment remains reliable.
SEWING MACHINE COMPONENTS

To ensure no parts are lost, all components should be stored and transported as a set, in such a way as not to cause damage to the equipment.

Sewing machine (Fig 2,3)
- Check the machine is clean and not damaged.
- Check the plug and power cable are not damaged.

Case (Fig 4)
- Check the case is not severely damaged.
Turn the motor handwheel in operating direction (clockwise) to check if the machine works.

Loosen screw A and set thread rod B so that its lower end is flush with the underside of thread cone support C. Retighten screw A.
THREADING DIAGRAM
FOR
SEWING MACHINE

Picture 3

THREADING DIAGRAM FOR DOUBLE LOCKED STITCH

THREADING DIAGRAM FOR SINGLE THREAD CHAIN STITCH

Geofabrics NZ Ltd

Revised Nov 08
Diagram for two thread double locked stitch, type 401. Styles 2200 A, 2200 B, 2200 F and 2200 AS.

CAUTION!
Pull out mains plug before threading!
OILING DIAGRAM FOR SEWING MACHINE

Picture 5

CAUTION!
Pull out main plug before oiling!

Picture 6

!!! CAUTION !!!
OIL SHOULD BE APPLIED DIRECTLY TO OIL SPOTS 1 - 11 ONCE A DAY. POINTS 1, 2 AND 3 ARE ESPECIALLY IMPORTANT.
RECOMMENDED OIL: MOBIL D.T.E OIL MEDIUM

VIEW IN DIRECTION OF ARROW X
Question: How do I sew geosynthetics?

Answer: It’s surprisingly easy. Just follow these simple instructions.

First, take the two pieces of geosynthetic fabric and hold the edges together to make either a prayer seam, “J” seam or butterfly seam (see page 6). Guide the fabric into the machine and depress the orange button to start sewing. The machine will then start stitching the fabric, and pulling the fabric into the machine on its own.

At this point, all the operator does is hold and guide the machine as the machine continues to feed the fabric on its own. The operator doesn’t pull the machine along, the machine does that itself. Pulling the machine will cause the needle to bend, and that could result in costly downtime, broken needles, broken loopers, broken throat plates or loss of timing on the machine.

That’s it. Pretty simple. Now here are a few helpful hints to increase your productivity.

1. Use three people. Three people make the job move faster and reduce the chance of job downtime.

   - The first person holds and helps support the weight of the two pieces of geosynthetic fabric and aligns the two edges of the fabric.
   - The second person holds and guides the sewing machine, being careful not to allow the weight of the fabric to put excessive stress on the sewing machine needle, causing the needle to break.
   - The third person helps support the fabric after it has been sewn and checks the quality of the stitching.

2. Two sewing machines at the job site. It is much less expensive to purchase a second sewing machine as a back up than to pay idle workers and idle earth moving equipment should the first sewing machine be down for maintenance.

3. Keep the wind from blowing the thread off the cones. On windy days, the thread may have a tendency to ravel off the cones. What you can do is cut the feet out of ladies’ nylons, snip off the toe and put them over the thread cones to keep the thread from blowing in the wind.

4. There is a short learning curve using a sewing machine, so try to choose the same people to operate the sewing machine throughout the project.
Question: What equipment do I need?

Answer: Determine how and where you are going to use the equipment. Are you going to sew at the job site? Or will assembly be done somewhere else and then the geosynthetic fabric brought to the site? What are the engineering specifications of the project? Is the material light to medium in weight, or heavy weight? Your answers will determine what equipment you will need for the job.

On the job site:

1) Use a hand held machine with 3/8-inch capacity.

2) Use a sewing machine that sews a two-thread double locked stitch (Federal Stitch Type 401) for security of the stitch and seam strength and quality.

3) Use a machine with an adjustable stitch length. This gives you the versatility to sew different fabrics with the proper seam strength. Adjustments from 3 to 8 stitches per inch is ideal.

4) Use an electric motor for standard use, or an air-operated motor in hazardous conditions, such as sewing in the rain or sewing in or around water.

5) Be sure it can handle the hard knocks of your job site. Rugged, dependable construction is a must.

Extra-heavy fabrics and off-site sewing:

1) Use a machine for heavy-duty fabrics with a 3/4-inch capacity.

2) Use a sewing machine that sews two rows of stitching (Federal Stitch Type 401). The second row offers increased seam strength.

3) Use a machine with an adjustable stitch length. This gives you the versatility to sew different fabrics with the proper seam strength.

4) Be sure it allows you the option to sew both in the field or in the factory.

5) Be sure it can handle the hard knocks of your job site. Rugged, dependable construction is a must.

Additional equipment:

1) Large thread stand for portable sewing machine to hold one-pound cones of thread so you can sew longer without stopping to re-thread.

2) MB 100 Metal box that holds up to two portable machines, protecting them when they are not in use.

3) Suspension assembly for heavy-duty sewing machine to make it easier to handle on the job site.
Question: What thread and seams do I use?

Answer: Contributing to the strength of your seam are the type of fabric you are sewing and the thread you are using. Fabric and thread suppliers can assist in determining the proper thread for your specific application.

Variables to consider when choosing the right thread are:

1) Does the finished seam need a certain strength?
2) Is the thread subjected to wet or dry conditions?
3) Is the thread subjected to ultraviolet light (surface use)?
4) Is the thread for use underground?

In addition, the number of stitches per inch (SPI) influences seam strength. Your optimum seam strength is dependent upon the fabric type and your SPI. Too few stitches per inch and the sewn seam may not be strong enough. Too many stitches per inch and the needle penetrations may weaken the fabric, resulting in a “Zippering” or “Tear along the dotted line” effect.

There are three different seam types used. 1) SsA-1 (prayer seam) 2) Ssn-1 (J seam) 3) Ssd-1 (butterfly seam)

The project specifications may indicate which type of seam to use for the job.

The number of rows of stitching is often determined by the job specifications. Hand held machines make one row of stitching at a time. Heavy-duty, two-needle machines make two rows at once. A second row of stitching can be accomplished with a hand held machine by sewing the seam twice.

Question: How much thread will I use?

Answer: The amount of thread you need for your project depends on the type of fabric being sewn.

The chart and formula below are helpful guidelines for determining how much thread you need for your project:

<table>
<thead>
<tr>
<th>Fabric Weight</th>
<th>Amount of thread* (401 Stitch)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Light</td>
<td>4 yards of thread for each yard sewn</td>
</tr>
<tr>
<td>Medium</td>
<td>6 yards of thread for each yard sewn</td>
</tr>
<tr>
<td>Heavy</td>
<td>9 yards of thread for each yard sewn</td>
</tr>
</tbody>
</table>

*Actual consumption may vary

Thread usage formula for each row of stitching

\[
4 + [2 \times (\text{thickness of seam}) \times \frac{1}{\text{length of thread used}}] = \text{inches of thread used per inch sewn.}
\]

Question: How do I care for a sewing machine?

Answer: Let’s face it, you are probably too far from the shop to fix it, so proper maintenance is essential.

1) Oil the machine at least twice each day.
2) Monitor the needle condition daily and change as needed.
3) Remove dirt, lint or any foreign material from the machine after each day’s use, or more frequently if conditions warrant.
4) Keep extra parts on hand at all times, including needles, loopers, upper and lower knives and feed dogs.
5) And lastly, whenever possible, get factory training for your mechanic. Union Special Corporation’s Technical Training Center offers a course specifically for maintaining and repairing these types of machines. Training will pay big dividends in the future by keeping your machines up and running.