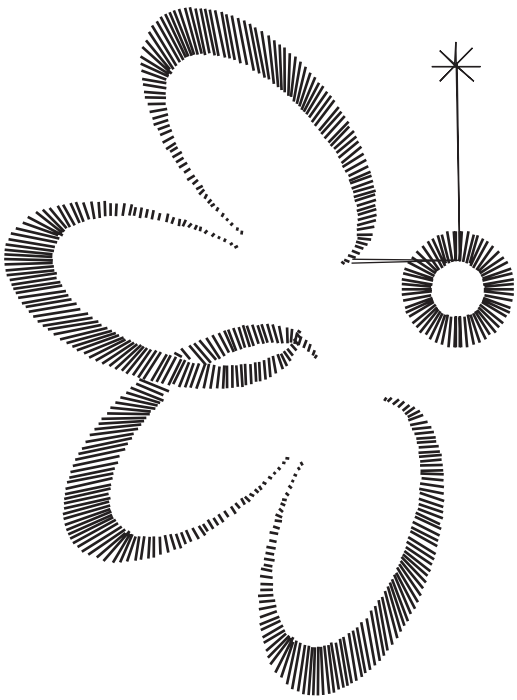
# Operating Manual



## Boring attachment

Version 1.0

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# BORING ATTACHMENT

The boring attachment enables users to produce eyelet embroidery with their ZSK embroidery machine. For this purpose a borer is mounted on the needle bar of every embroidery head in place of the third needle. The borer cuts holes in the embroidery material at places designated by the boring design. These holes are then edged with suitable embroidery stitching and secured.

**WARNING**

**The borer is a cutting tool and is therefore razor sharp. Observe the following safety instructions to avoid injury:**

- **Never touch the tip of the borer, always hold by the shank.**
- **Free borers that have become jammed with a suitable pair of flat nose pliers.**
- **Do not leave dismantled borers on the work table or anywhere else on the machine. Clear away loose borers immediately to avoid causing injury to yourself and others.**

## Installing borers

When delivered, the embroidery machines are fitted with the boring attachment which the user has specified and are ready for operation i.e. the attachment has been fully mounted and adjusted.

**WARNING**

**Retrofitting a boring attachment to a machine that has already been delivered is a specialist task that must be carried out only by appropriately trained ZSK staff or by ZSK authorized agents.**

**The machine must be switched off at the main switch before carrying out any retrofitting procedures.**

Since the installation must always be carried out by a skilled specialist, only a brief overview of the necessary steps is given here.

### Changing the needle plate inserts

- Exchange all the needle plate inserts for inserts specially designed for borers, and align them centrally beneath the needle.

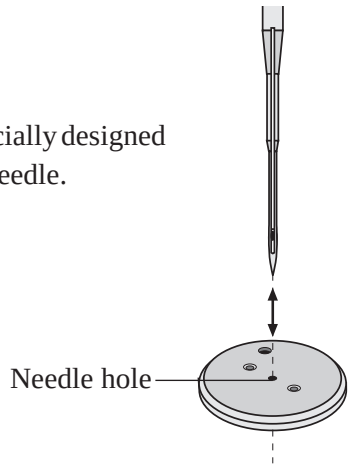



Figure 1:
Needle plate insert for borer, central alignment beneath the needle

### Removing components at needle bar 3

- Dismantle front panel, plush strip, thread gripper strip and thread deflector strip.

- Remove needle and needle holder.

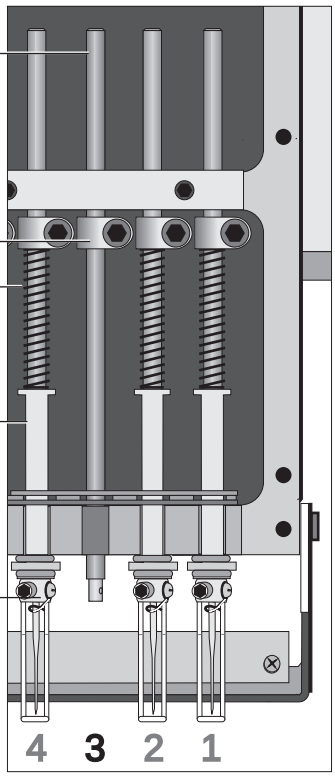
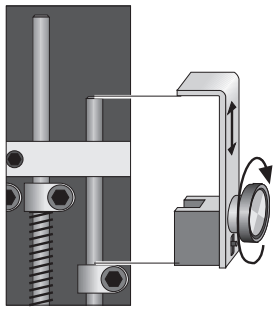



Figure 2 (left): Removing components at needle bar 3

Figure 3 (right): Setting needle height gauge

- Accurately measure the distance between the driver and the top end of the needle bar using a needle height gauge.

- Remove the presser foot and spring. Then re-position the driver exactly using the needle height gauge.



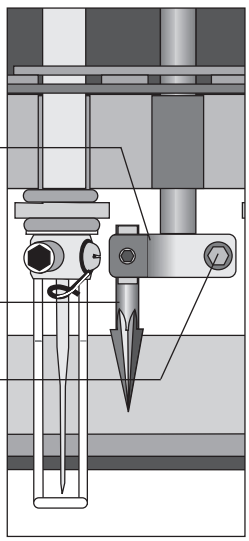


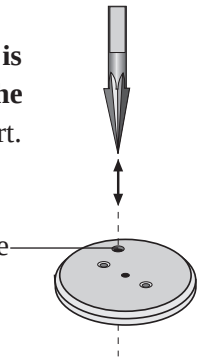

Figure 5 (left): Installing borer holder

Figure 6 (right): Aligning borer over needle plate insert

### Installing the borer holder

- Push the borer holder with the inserted borer onto needle bar 3, in place of the needle holder.

- Turn the borer holder until the **borer is positioned exactly centrally over the boring hole** of the needle plate insert. Tighten clamping screw.




Setting the borer height

Engage the upper shaft at an angle of 139° and set the distance between the borer tip and the needle plate insert to 0.8+0.1 mm (cf. ‘Changing the borer’).

### Setting the DIP switches

- Remove the left protective cover for the girder (as seen from the back of the machine) and set DIP switches S13 - S16.

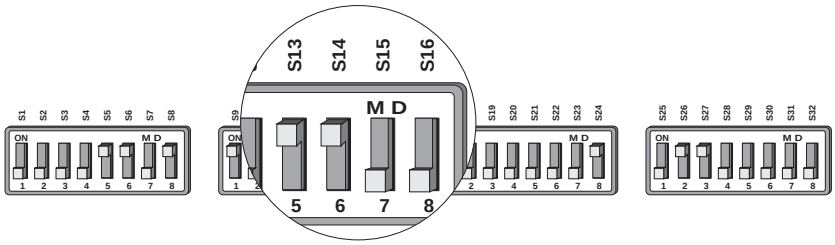



Figure 7:
DIP switches on the distribution board, Switch settings S13 - S16 for borer (the settings for the other switches vary according to the machine configuration)

**WARNING**

**Do not start operating the machine until the front panel, plush strip, thread deflector strip and thread gripper strip and all protective covers have been correctly replaced.**

## Changing the borer

Despite their high material quality, the borer tips and flanks are subject to wear. The service life of the borer depends on how often it is used and the properties of the embroidery material being bored.

In the event of borer wear, we recommend that you replace the borers on **every** embroidery head. By replacing all the borers at once, the machine down-time is considerably shorter than if each borer were renewed in succession at short intervals.

**NOTES**

**You can easily change the borers yourself. Detailed instructions on how to do this are contained on the following pages.**

**When changing the borers, be careful not to slacken off the clamping screw (on the right of the borer holder). This would necessitate resetting the borer holder.**

**Needle bar 3 must be in its top position (TDC) when the borer is being changed. If this is not the case, move the needle bar to the top position with the handwheel.**

## Tools required for borer changing

| | |
|---|---|
| Cross-recessed screwdriver | for installing/removing the protective cover |
| Allen key 6 mm | for screws in the upper shaft clamp |
| Allen key 1,3 mm | for pressure screw in borer holder |
| Upper shaft clamp | for engaging the upper shaft |
| Feeler gauge 0,8 mm | for engaging the upper shaft |

The required tools are included in the delivery scope and provided as accessories with the machine.

Pressure screw

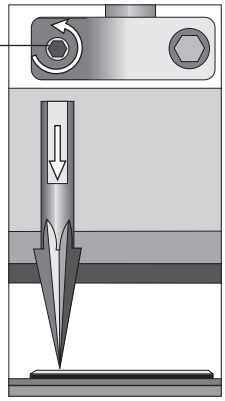


Figure 8:
Slackening off pressure screw and removing borer

## Removing the borer

- Slacken off the pressure screw (on the left of the borer holder) by turning through one to two revolutions.
- Take off the borer.

Pressure screw

Borer, surface of shank at front

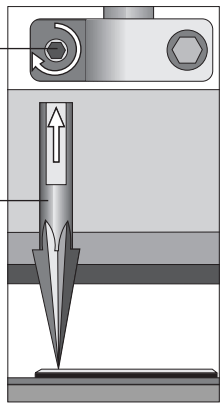


Figure 9:
Inserting borer and tightening pressure screw

## Inserting the borer

- Insert the new borer in such a way that the surface of the borer shank faces forwards towards the pressure screw. This is necessary to stop the borer shank from being damaged when the pressure screw is tightened. The borer is also aligned with a cutting edge facing forwards.
- At this stage, tighten the pressure screw lightly.

## Setting the borer height

**NOTE**

**When the main shaft is set at 139°, the correct distance between the tip of the borer and the needle plate insert is 0.8+0.1 mm. The gap must not be less than 0.8 mm as the borer tip would otherwise come into contact with the feeler bow of the bobbin thread monitor when boring.**

Protective cover with pegs

Handwheel with dial

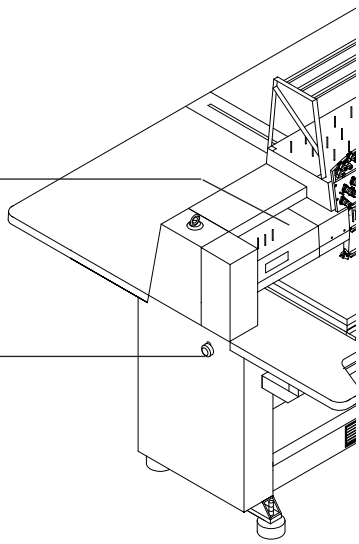


Figure 10:
Left side of machine

- Remove the protective cover with bobbin pegs on the left side of the machine. This exposes part of the upper shaft (cf. Figure 11).
- Turn the handwheel until the reading on the dial above it is 139°.

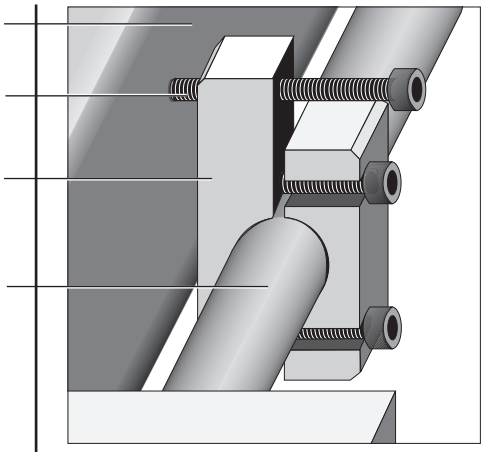



Figure 11:
Clamping upper shaft

- Fix the upper shaft clamp on the upper shaft as shown in the drawing. The adjusting screw must press against the machine girder at the top.
- Check that the reading on the dial is exactly 139°. The angle can still be adjusted once the clamp has been fixed by means of the adjusting screw.

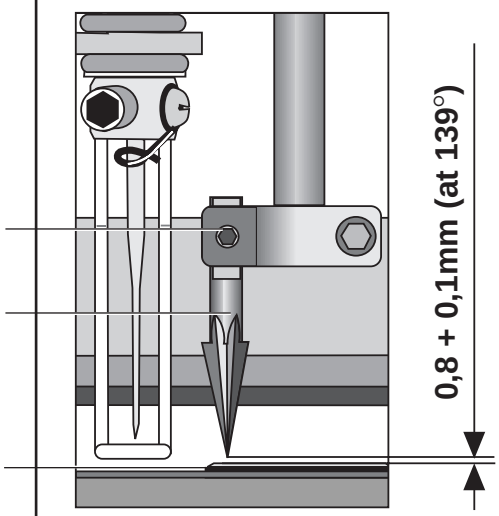



Figure 12:
Setting borer height

- Clean the needle plate insert and place the 0.8 mm feeler gauge between the borer and needle plate insert.
- Slacken off the pressure screw on the borer holder and pull down the borer until it rests on the feeler gauge.
- Tighten the pressure screw.
- Remove the feeler gauge and upper shaft clamp.
- Refit the protective cover correctly over the upper shaft.

**WARNING**

**Do not start operating the machine until the protective cover has been correctly replaced.**

## General tips for boring

### Processing boring designs in the editor

The control allows you to process boring designs using the EDITOR module. Please refer to the relevant ‘Control’ operating manual.

### Needle assignment

When carrying out the needle assignment, note that needle 3 has been replaced by the borer and is therefore not available for embroidering.

For the best results, use needles 2 or 4 for edging stitches. Needles 1 and 5, which are next to needles 2 and 4 respectively, also give good results. Needles which are further away from the borer are not suitable for finishing eyelets since their upper thread take-off would be too great.

### Boring speed

The boring speed can be set in the SET UP option in the menu of your control (please refer to ‘Control’ operating manual). Comply with the maximum embroidering speed when setting the boring speed. You can generally also bore at this speed setting.