ALEXYS AS 100

Installation instruction
Needle unit repair kit

Symbols

The following symbols are used on the equipment:

Consult the manual for further safety instructions

Frame or chassis ground terminal

The following pictograms are used in this manual:

Caution

Caution, risk of electric shock or other electrical hazard (high voltage)

Safety practices

The following safety practices are intended to ensure safe operation of the equipment.

Electrical hazards

- Removal of panels may expose users to dangerous voltages. Disconnect the AS 100 from all power sources before removing protective panels.
- Always replace blown fuses with fuses of the size and rating indicated on the fuse panel and holder. Refer to Appendix B of this manual for more information on fuses.
- Replace or repair faulty insulation on power cords.
- Check that the actual power voltage is the same as the voltage for which the AS 100 is wired. Make sure power cords are connected to correct voltage sources.
- The AS 100 must only be used with appliances and power sources with proper protective grounding.

Take precautions against electrostatic discharge during installation/removal of boards, EPROM's or other electrical components at all time to prevent damage of the circuit boards.

Other precautions

The AS 100 has sharp needles and moving parts care should be taken to prevent personal injury or damage to parts of the AS 100.

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C H A P T E R 1

Introduction

This instruction describes the disassembly and installation of all parts in the AS 100 needle repair kit (p/n 180.0523). The procedure is written for trained and qualified service engineers, who are experienced with the AS 100 and ALEXYS data system software. For more details on adjustments, assembling and troubleshooting use the service manual (p/n 181.0020) as reference. For instructions on the ALEXYS data system, use the Help file of ALEXYS or the user manual (p/n 185.0010) as a reference.

Before you start, be sure you have read and understood the procedure and the information.

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Tools

The list bellows gives an overview of the tools needed for the installation of the parts in the needle unit repair kit (p/n 180.0532):

Service tools

Philips screwdriver #1*
Philips screwdriver #2 (long shaft)
Micro Philips screw driver
Flat head screwdriver
Hex key 2 mm*
Hex key 2.5mm
Wrench ¼” + 5/15”

*) not shown in figure 1.

***Figure 1**. Required tools.*

Contents of shipping box

Inspect the *transport box* for possible damage as it arrives. Immediately inform the transport company in case of damage, otherwise she may not accept any responsibility. Carefully unpack the kit and inspect it for completeness and possible damage. The contents of the needle unit repair kit is shown in figure 2.

Figure 2. *Contents of needle unit repair kit. Left: Flex print with motor. Middle (top): spindle assy. Middle (bottom): needle unit body. Right: pre-punctioning needle.*

C H A P T E R 2

Installation procedure of repair kit

This section describes the installation of all parts of the needle unit repair kit. Please follow all the steps in this procedure carefully:

Make sure that the mains cable is disconnected before opening the machine.

Opening the AS 100

Figure 3. *Front view of AS 100.*

Front side:

- Remove the screws encircled in red (straight line) with a Philips screwdriver.
- Remove the screws encircled in green (dotted line) using an Hex/Allen key.

Figure 4. *Back view of AS 100.*

Back side:

- Remove the screws encircled in red (straight line) with a Philips screwdriver.

Subsequently, remove the top and side panels of the AS 100.

Figure 4. *Side view (right side) of AS 100.*

- Remove the screw encircled in red (straight line) with a Philips screwdriver. Now the back-plane can pivot for better access to the electronics compartment.
- Make sure that the needle arm unit is in its home position and pull AS 100 back plane backwards to open up the unit. See photo-graph on the next page.

Do not force the back plane so far backwards that the flex print (brown plastic print connected to needle unit PCB) is subjected to extreme tension. This may damage the flex print.

Figure 5. *Opening electronics compartment of the AS 100 (red circle: flex print).*

Disconnecting Flex print from PCB

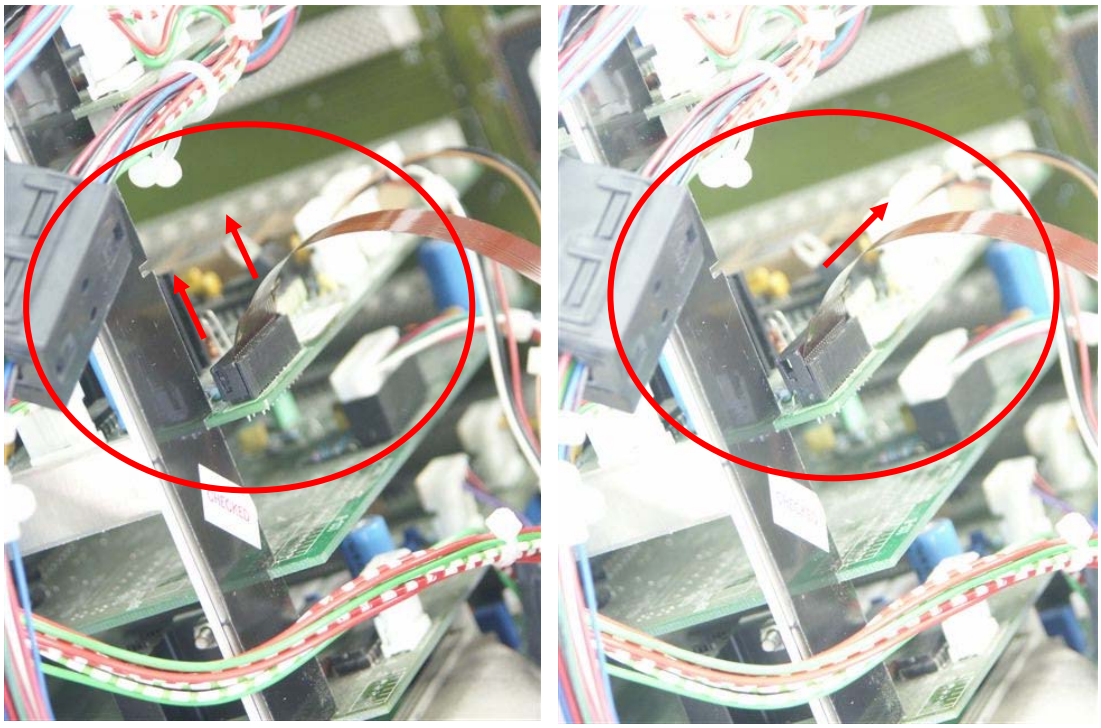

Figure 6. *disconnecting flex print from needle arm PCB. Left: closed PCB connector. Right: opened PCB connector).*

- Hold the sides of the PCB connector between thumb and pointing finger and pull top part of the PCB connector up in the directions marked by the arrows.
- Pull the flex print out of the opened PCB connector.

Removing the flex print from the needle arm

- Pull the needle arm unit to the front manually.

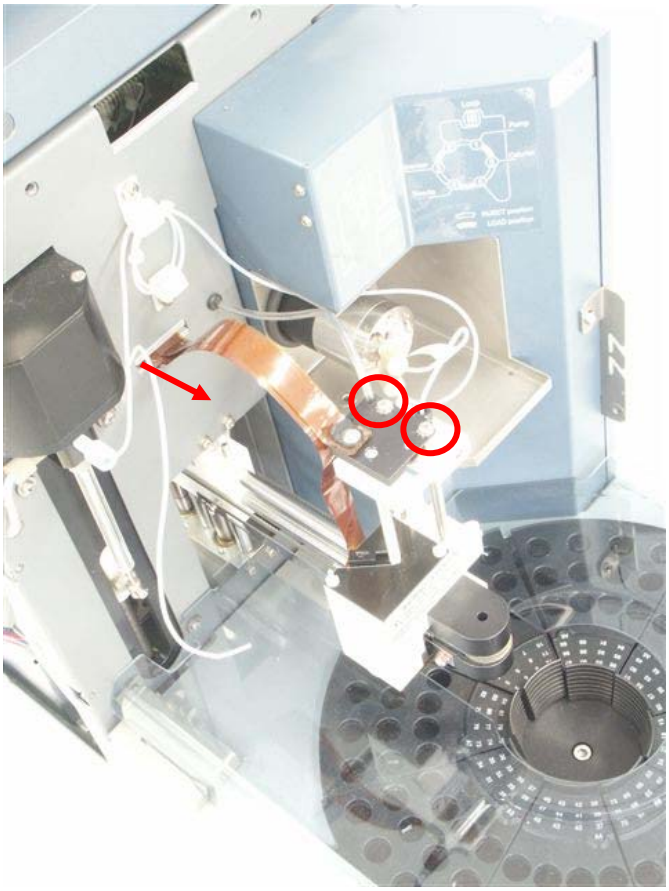

Figure 7. *Needle arm unit moved towards front position.*

- Guide the loosened Flex print connector from the back side through the slit in the front panel in the direction indicated by the arrow.
- Remove the 2 screws on the top plate of the needle arm unit and gently pull the top plate off.
- Remove the home sensor mounted on the bottom side of the needle arm unit top plate using a Phillips screwdriver.

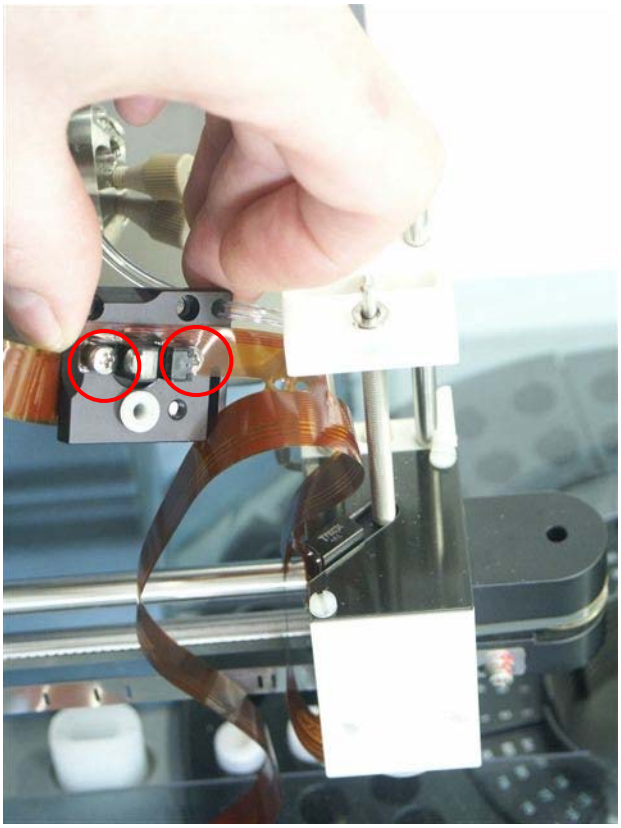

Figure 8. *Optical home sensor mounted on the needle arm unit top plate.*

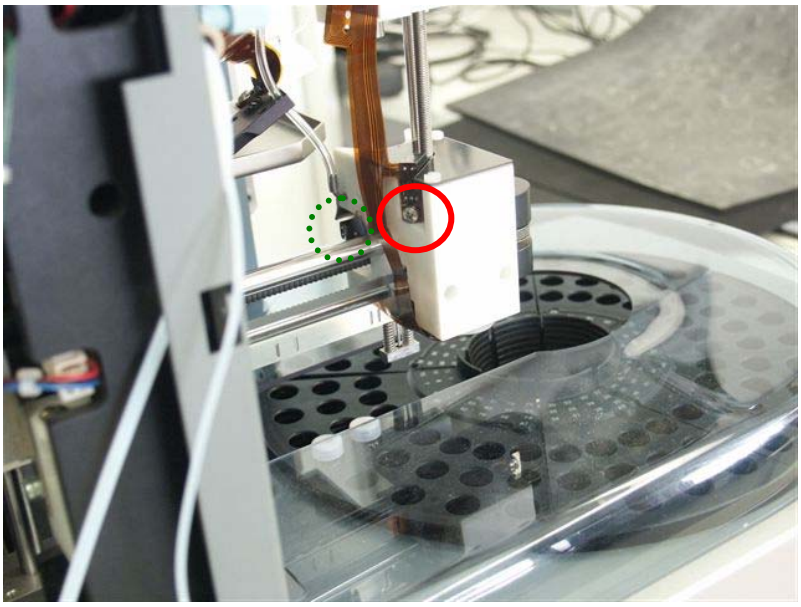

Figure 9. *Optical sensors for spindle rotation (right) and the vial stripper (left).*

- Remove the screw encircled in red (straight line) with a Philips screwdriver to loosen spindle rotation sensor.
- Remove the screw encircled in green (dotted line) using an Hex/Allen key to loosen the vial stripper sensor.

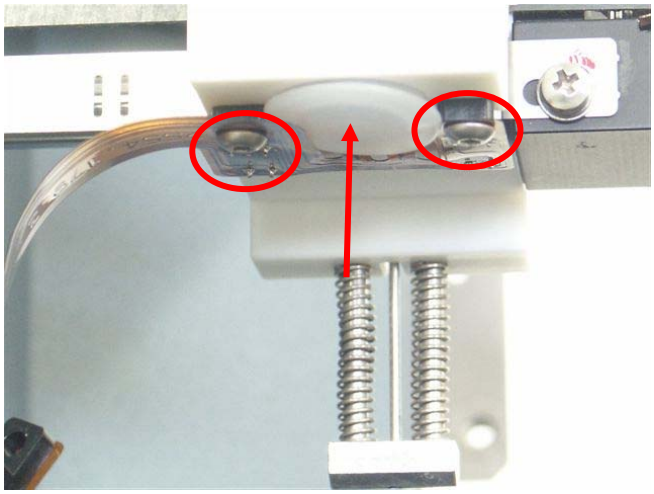

Figure 10. *Bottom view of the needle arm unit: Optical sensors for horizontal movement of the needle arm unit.*

- Remove the screws encircled in red (straight line) with a Philips screwdriver to loosen the sensors for horizontal movement of the needle arm unit.
- Remove the white closing cap of the spindle motor compartment (red arrow).

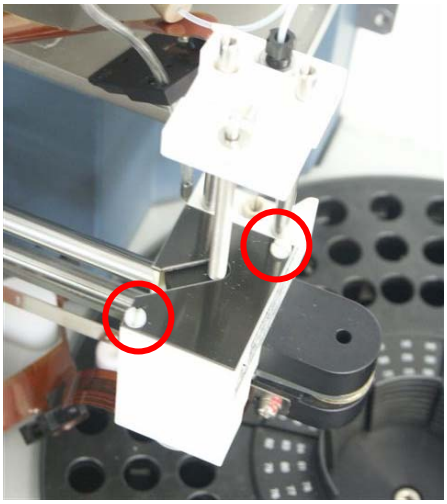

Figure 11. *Top view of spindle wheel / motor compartment.*

- Remove the nylon screws encircled in red (straight line) with a flat screw driver to open up the spindle wheel / motor compartment.
- Remover the black plastic plate covering the spindle wheel.

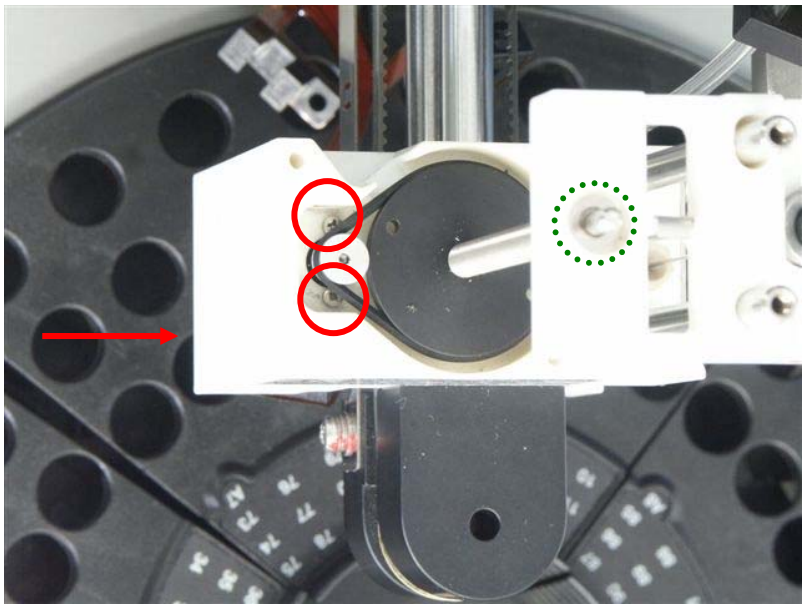

Figure 12. *Top view of spindle wheel / motor compartment with cover removed.*

- Remove the black transmission belt of the motor wheel.
- To loosen the DC motor remove the small Philips screws encircled in red (straight line) using a micro Philips screw driver.

When loosening the screws, position your hand (red arrow) below the needle arm unit under the opening of the spindle motor compartment to catch the motor at the moment it is released. Otherwise the motor will drop on the tray segments below.

The Flex print is now completely removed from the AS 100 needle arm unit. Continue with the next step.

Replacement of the spindle assy

Follow the steps below to remove the spindle assy and to replace it by a new one.

- Remove the sample needle from the needle body (see AS 100 user manual, 181.0010).
- Remove the metal ring on top of the spindle axis. See part encircled in green (dotted line) in figure 12.

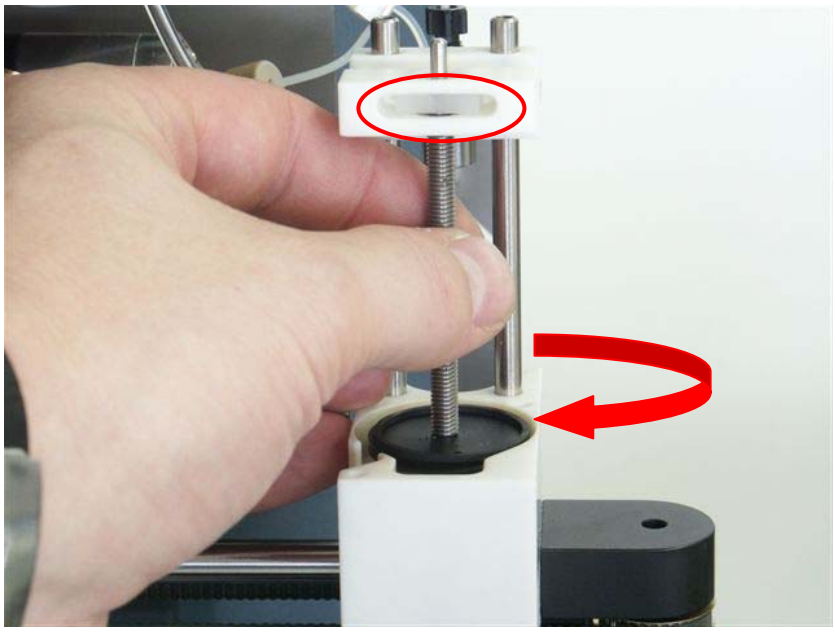

Figure 13. *Removal of spindle assy.*

- Rotate the spindle manually in the counter-clockwise direction to release spindle from the sample needle body. Turn until the tranport block (encircled in red) is completely free.
- Move the needle body upwards to be able to remove the spindle assy completely. The spindle assy consist of 1. spindle with integrated disk, 2. black transmission belt and 3. transport block.

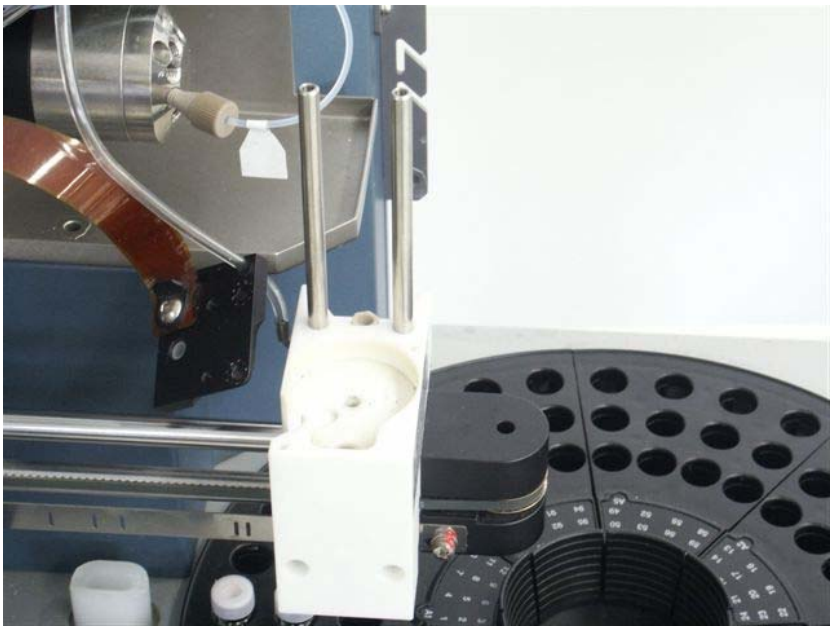

Figure 13. *Needle arm unit with flex print and spindle assy removed.*

- Install the new spindle assy by following the previous instruction in the reversed way.
- Check manually if the spindle/transport block moves smoothly.
- Do not yet install the new sample needle yet. The sample needle will be installed in a later stage of the installation procedure.

Installation of the new flex print with motor

Install the new flex print assy by following the instruction in the paragraph “Removing the flex print” in the reversed way. Below a small summary is given of the sequence of steps:

- First install the motor in the motor compartment of the needle arm unit. To do so, push the motor in the motor compartment (bottom side of the needle arm unit and hold it in place with the fingers of one hand. Make sure that the threads of the motor are positioned above the screw holes in the needle arm unit. Fix the screws with the other hand.
- fix the black transmission belt onto the motor wheel and spindle wheel.
- Close the cover of the spindle wheel compartment (nylon screws).
- Fix the optical sensors for the horizontal movement (hex screws).
- Place the closing cap of the motor compartment.

- Fix the sensor for vial detection sensor (hex screw).
- Fix the spindle rotation sensor (Phillips screw).
- Fix the needle home sensor (2 Phillips screw).
- Mount the black top plate onto the needle arm unit (2 Phillips screws).
- Guide the flex print connector through the slit into the electronics compartment.
- Push the needle arm unit back in its home position again manually.
- Open the electronics compartment by pulling the back plane of the unit backwards (pivoting).
- Fix the end of the flex print into the black connector on the needle arm unit PCB. Correct procedure: [1] first insert the flex print end as far as possible into the black PCB connector with the metallic contacts facing towards the printed circuit board. [2] Subsequently close the clip by pushing it downwards from both sides.

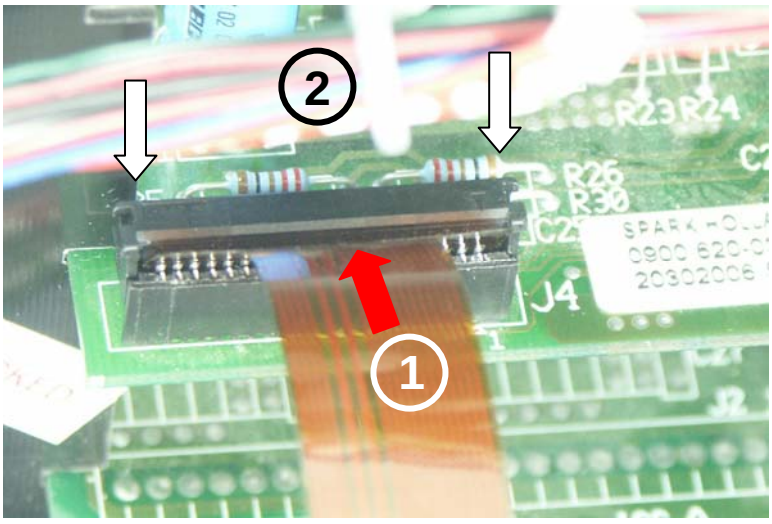

Figure 14. *Flex print connector on needle unit PCB.*

- Close the electronic compartment again by pushing the backplane back in straight position again.

Do <u>not</u> close the AS 100 unit or mount the covers yet! First some electrical test has to be performed to test if the flex print is correctly installed.

Replacement of prepuncturing needle

See user manual (181.0010) for additional information about the (installation of) sample or prepuncturing needle. The following steps have to be executed to replace the prepuncturing needle:

- Move the needle arm unit in front position again manually.

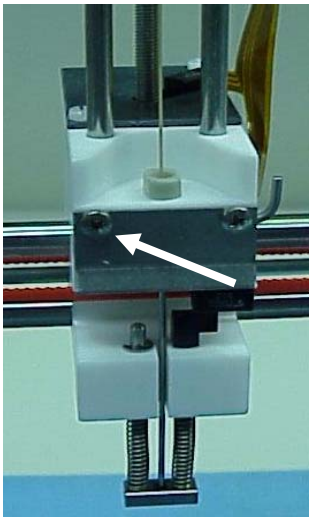

Fig. 15. *Needle arm unit.*

- Remove the left screw marked with the white arrow completely with a Phillips screwdriver.
- Loosen the right screw a little bit so the metallic cover will move downwards, making the prepuncturing needle accessible for service.
- Remove the old prepuncturing needle with a wrench.
- Install the new needle from the kit.
- Remount the metallic cover.

Reinstallation of sample needle

Reinstall the sample needle. The installation of the sample needle is described in the user manual (p/n 181.0010).

Mechanical & electronics test

The following check should be performed to test if the installation of the kit was successful before mounting all metal covers again:

- Move the spindle manually in clockwise and counter clock wise position to check if the sample needle is transported up and downwards without any obstruction or friction. Be careful that the sample needle will not crash into the tray segments/vials below. If not recheck the needle arm unit again to see if some part was mounted incorrectly or is obstructed.
- Make sure that the needle arm unit is in front position. If not move it in that position manually.
- Move the sample needle a little downwards by moving the spindle in the appropriate direction manually. The sample needle should be visible below the tip of the prepuncturing needle.
- Connect the mains cable.

Do not touch the inside/metal parts of the unit to avoid potential risk of exposure to hazardous voltages

- Switch the unit on. The AS 100 will now initialise itself. During this procedure the AS 100 will move the sample needle in its home position (spindle will turn to move needle upwards). Subsequently, the complete needle arm unit will move to its home position. If this procedure is completed successfully proceed with the next step. In case of an acoustical error signal (beeping) execute the following steps:
    - Switch the unit off.
    - Remove the mains cable.
    - Check and reinstall the flex print into the black connector of the needle arm PCB.
    - Check for obstruction of the needle path or friction of spindle movement.

  If error persists check visually if the flex print or one of its components is damaged and contact the support department of Antec Leyden for further assistance.

Installation of metal covers

Close the unit and reinstall the metal covers by following the instructions in the section “Opening the AS 100” in the reverse way.

The unit is now ready for use again. If required by the customer perform the necessary Qualification procedure to assure the correct performance of the unit.