
Agilent 7683 Automatic Liquid Sampler

Service Manual




Agilent 7683 Automatic Liquid Sampler Service Manual

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System Overview

Chapter 1

System Overview

Modules

The 7683 Automatic Liquid Sampler system, shown in Figure 1, can include:

- One G2612A ALS interface board (required on 6890 GC, not used on 6850 GC)
- One or two G2613A injector module(s)
- One G2614A 100 vial tray (optional, 6890 GC only)
- One G1926A Bar Code Reader (optional, 6890 GC only)—requires INET integrator or ChemStation

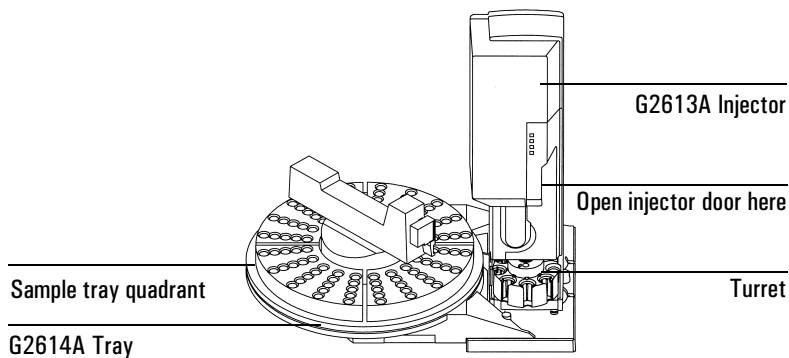


Figure 1 The 7683 Automatic Liquid Sampler system

Compatibility

A 6890 GC **without** the ALS interface board can use only the 7673 ALS.

A 6890 GC **with** the ALS interface board can use only the 7683 ALS.

The 6850 GC uses only the 7683 ALS.

Safety

Before servicing the various components of the GC, observe the following safety precautions.

Caution

Follow the precautions below when servicing the instrument to avoid data loss or damage to the instrument.

Printed circuit boards

When storing printed circuit boards (PCBs), always place them in static control envelopes or enclosures.

Always make sure you are properly grounded (e.g., wearing an ESD strap) before handling electrostatic sensitive components such as printed circuit boards.

Voltage carrying components

When disconnecting plugs, pull on the plug, not its wires. Pulling on the wires may cause breakage.

Warnings

The following are potential hazards that can cause personal injury.

Heated components

Parts of the injector may become hot. Turn off the GC oven and inlet/detector heated zones and allow them sufficient time to cool before servicing those areas. If you must perform service on components that have not fully cooled, wear protective gloves.

Voltage carrying components

Whenever possible, disconnect the G2613A Injector and G2614A Tray from the GC before working on them.

Whenever possible, disconnect the GC from its power source before working on or near voltage carrying components of the GC.




The following components carry voltage when the GC is plugged in even if the power switch is off:

- The AC power cord
- The AC power supply

When the power to the GC is turned on, potentially dangerous voltages exist on these additional components:

- The power transformer
- All electronics boards
- All internal wires and cables connected to these boards
- The injector, tray, and bar code reader cables that connect to the GC
- All internal wires, cables, and boards in the injector, tray, and bar code reader

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Configuration and Cabling

Chapter 3

Configuration and Cabling

Pinouts

Tray connector P1, to 6850/6890 GC

| Pin | Signal |
|-----|--------|
| A1 | TXD |
| A2 | RTS |
| A3 | DTR |
| A4 | MRESET |
| A5 | GND |
| A6 | VAC1 |
| A7 | GND |
| A8 | VAC2 |
| B1 | RXD |
| B2 | CTS |
| B3 | DSR |
| B4 | GND |
| B5 | GND |
| B6 | VAC1 |
| B7 | GND |
| B8 | VAC2 |

Tray connector P9, to the bar code reader





| Pin | Signal |
|------|--------------|
| 1 | +5 VDC |
| 2 | NC |
| 3 | NC |
| 4 | RRD0 (motor) |
| 5 | RRD1 (motor) |
| 6 | |
| 7 | GND |
| 8 | RR5V |
| PMH1 | GND |
| PMH2 | GND |

Tray connector J1, auxiliary

| Pin | Signal |
|------|--------|
| 1 | CD |
| 2 | RXD |
| 3 | TXD |
| 4 | DTR |
| 5 | GND |
| 6 | DSR |
| 7 | RTS |
| 8 | CTS |
| 9 | RI |
| PMH1 | GND |
| PMH2 | GND |

Configuration and Cabling
Pinouts

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Diagnostics

Chapter 4

Diagnostics

Theory of operation

G2612A ALS Interface board

The ALS Interface board routes messages between the GC main board and the components of the automatic liquid sampler system, and transmits power to the injector(s) and the tray. Errors detected by the injector or the tray are routed to this board, which then displays the error message on the 6890 GC or at the ChemStation.

Power from the transformer enters the board at J5. This voltage is partially rectified through half a diode bridge before being transmitted to the tray and the injector(s) at approximately 33 VAC. The other half of the diode bridge resides within the injector and the tray.

The ALS Interface board runs on +5 VDC from the main board through P5.

One fuse is located on this board at F1 to protect the transformer from overvoltage.

6850 GC

The 6850 GC directly controls and powers the injector and tray. The power circuitry is identical to that on the ALS interface board.

G2613A Injector

The G2613A Injector completes the rectification of power delivered by the ALS Interface board (6890 only) or the 6850, and interprets all commands received into the motions required to make an injection. Sensors and encoders are used






on the syringe carriage, plunger, and turret to locate the position of these parts and to control injection speed. Any errors detected are reported to the ALS interface board/GC main board, which displays the error on the GC.

G2614A Tray

The G2614A Tray consists of a platen which holds the sample vial quadrants, a bracket, a control board, and a robotic arm assembly that manipulates and moves the sample vials to the injector.

Half-rectified power to the assembly arrives through the cable to the ALS interface board, along with control signals. The board within the tray completes rectification of the 33 VAC power input, interprets all commands, and drives the robotic arm motors and the bar code reader.

Sensors are located within the tray and robotic arm assemblies to allow the tray board to determine the location of the gripper and to determine whether or not the gripper is carrying a vial.

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Replacement Procedures

Chapter 5

Replacement Procedures

Replacing the mounting post

The 6890 GC mounting post locations are shown below.

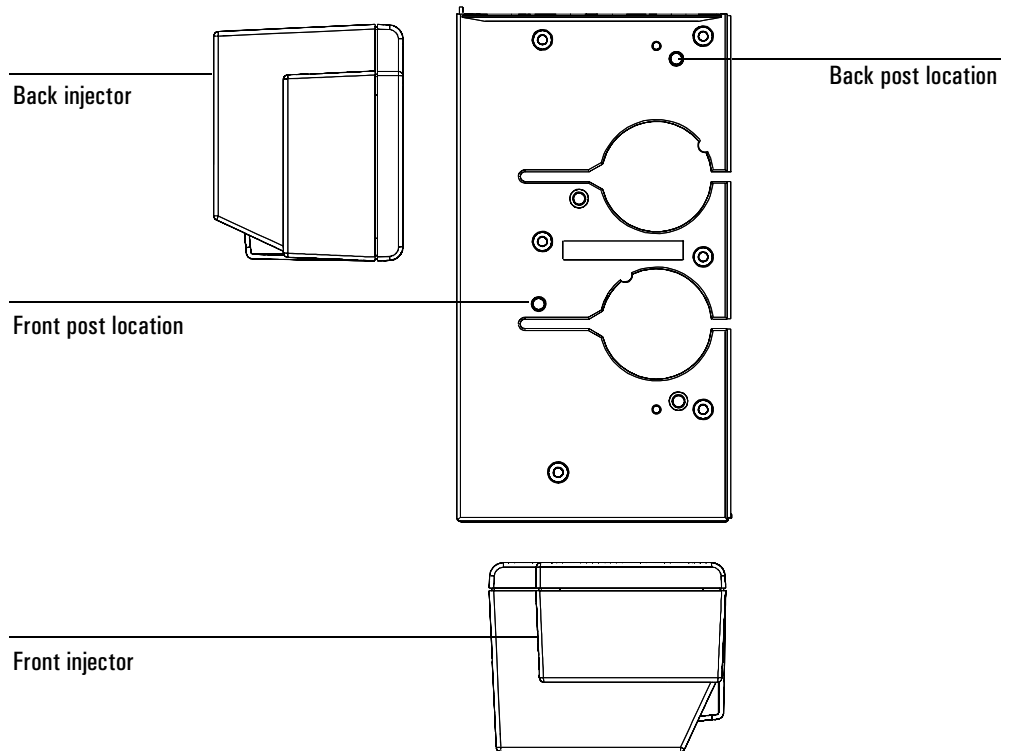


Figure 2 Mounting post locations

There is only one post location for the 6850 GC.

Replacing the G2614A Tray

1. Unplug the tray cable from the GC.
2. Remove the three injection port cover Torx screws shown in Figure 3 and remove the old tray.

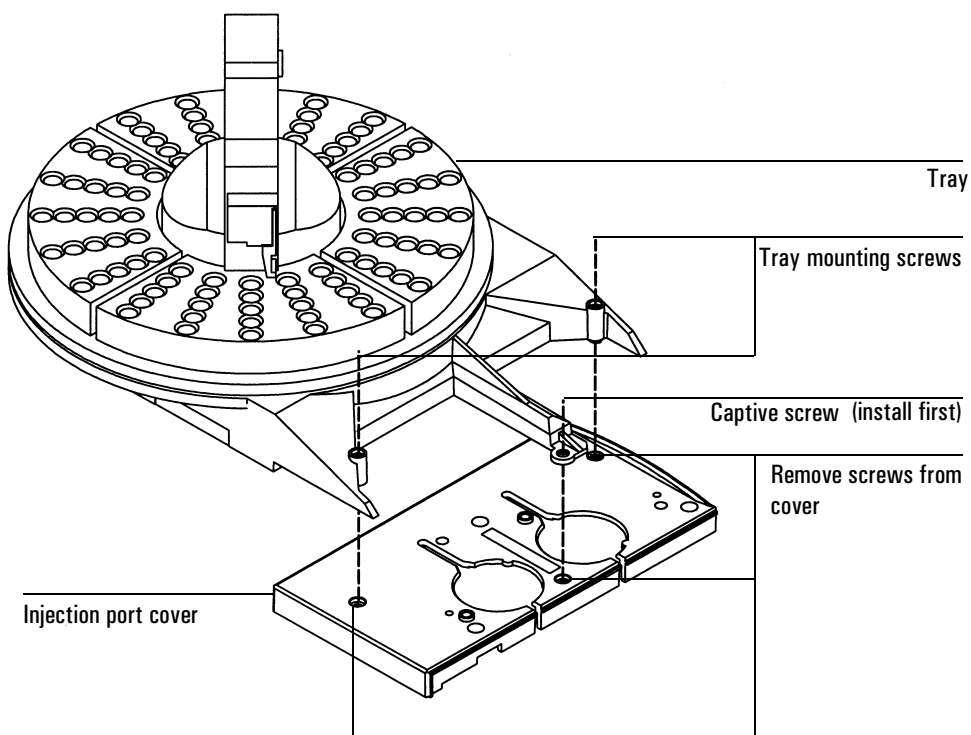


Figure 3 Installing the tray

Replacement Procedures

Replacing the G2614A Tray

Caution

Do not move or manipulate the robotic arm or gripper. Moving the arm or gripper back and forth can cause damage. If necessary, rotate the arm assembly a few degrees until there is enough clearance.

3. Align the new tray over the three holes in the injection port cover and locate in place. Tighten the captive screw in the center of the tray mounting arm to hold the tray in place. Install the two mounting screws into the tray and tighten until the tray is secure.
4. Install the tray quadrants. Slide the leading edge of each quadrant under the guides on the tray, then snap the front tab into the slot on the tray. See Figure 4.

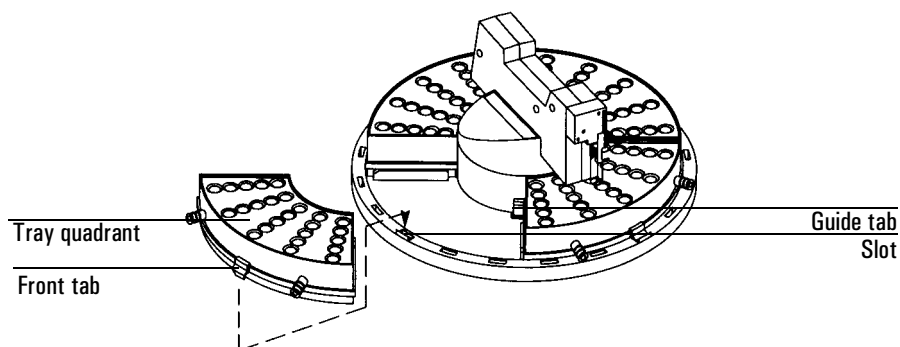


Figure 4 Install the tray quadrants

Replacing the G2613A Injector

Note Do not mount the G2613A Injector on a mounting post for a 7673 Injector. Remove the old post and replace it with the new one.

1. Unplug the injector cable from the GC.
2. Lift the injector off of the mounting post.
3. If necessary, install/replace the mounting post on the injection port cover in the front or back location, as desired.
4. Open the new injector's door. Slide the packing material and syringe carriage down, then remove the packing.
5. Mount the new injector. Line up the hole in the base of the injector that is nearest the cable with the mounting post. Lower the injector about an inch (2.5 cm) onto the post. See Figure 5.

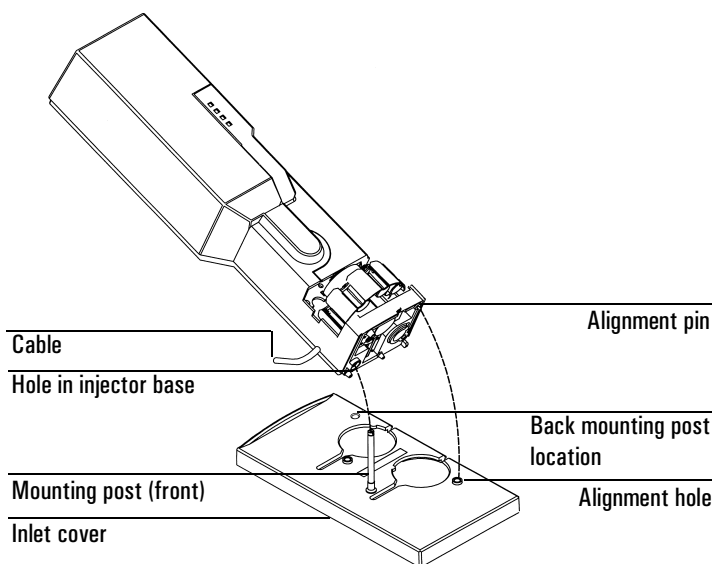


Figure 5 Mounting the injector (6890 GC shown)

Replacement Procedures
Replacing the G2613A Injector

6. Front location: Turn the injector so that the turret is facing the front of the GC. Lower the injector until the alignment pin in the base enters the alignment hole in the injection port cover.

Back location: Turn the injector so the turret faces the left side of the GC. Lower the injector until the alignment pin in the base enters the alignment hole in the injection port cover.

7. Check your work:

- The injector must be vertical.
- The alignment pin must be properly seated in the alignment hole.
- The injector feet should touch the injection port cover.

If the injector will not sit upright on the GC, check that the plumbing and cabling under the injection port cover are properly routed in their channels.

Replacing the G1926A Bar Code Reader

1. Unplug the old bar code reader cable from the tray. See Figure 6.

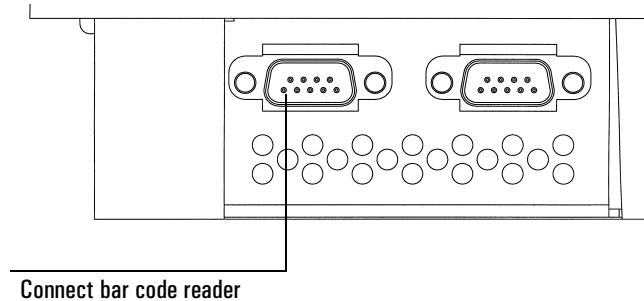


Figure 6 Connecting the bar code reader

2. Remove the bar code reader from the tray.
3. Install the new bar code reader. See Figure 7.

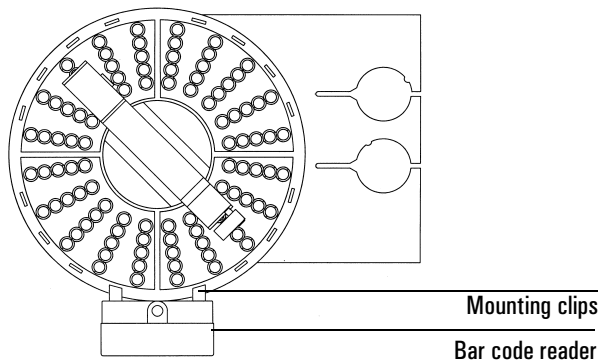


Figure 7 Mounting location for the bar code reader

Adjusting the bar code reader position

To adjust the bar code reader position:

1. Loosen the bracket mounting screws and the height adjustment screw.
See Figure 8.

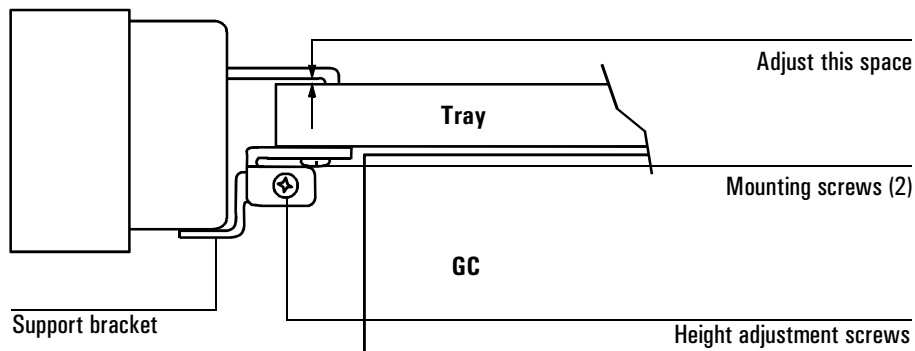


Figure 8 The bar code reader support bracket

2. Slide the support bracket towards or away from the tray until the top of the bar code reader is parallel with the tray surface. Tighten the mounting screws.
3. Adjust the bar code reader's height. Slightly loosen the height adjustment screw on the side of the support bracket and raise or lower the bracket until there is a very small gap—about the thickness of a piece of paper—between the mounting clips on the bar code reader and the tray. See Figure 8. Tighten the height adjustment screw.

Making a trial run

Use the following trial run to quickly check injector and tray operation.

1. Install an empty syringe in the injector.
2. Place empty bottles in the Solvent A and Waste A turret positions. Place an empty capped sample vial in the tray 1 position (or the turret sample 1 position, if not using the tray).
3. Set these following parameters on the GC:

| Parameter | Setting |
|--------------------|---|
| Injection volume | 1 |
| # Sample pumps | 1 |
| Viscosity delay | 0 |
| # Sample washes | 1 |
| # Solve A washes | 1 |
| # Solve B washes | 0 |
| Slow plunger | off |
| Pre-dwell time | 0 |
| Post-dwell time | 0 |
| Sampling offset | off (on if cool on-column inlet used) |
| # Solve A pre-wash | 1 |
| # Solve B pre-wash | 0 |
| # Injections/vial | 1 |
| Samples | 1-1 (101-101 for turret with ChemStation control) |

4. Set the GC oven program to 25°C with a 0°C/min ramp, a hold time of 0.1 minutes, an equilibrium time of 0.3 minutes, and an initial time of 0.3 minutes.

Replacement Procedures
Making a trial run

5. Store, load, then run the sequence.
 - If there are no faults, the injector will make one "injection" from the first vial position.
 - If any faults occur, see the *7683 Installation Guide*.

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Illustrated Parts Breakdown

Chapter 6

Illustrated Parts Breakdown

The following pages list the replacement parts for the 7683 Automatic Liquid Sampler.

Injector, part no. G2613A

| Description | Part No. | Qty/Assy |
|---|-------------|----------|
| 1. Injector module (new) | G2613-60910 | — |
| Injector module (exchange) | G2613-69910 | — |
| 2. Mounting post-G2613A | G2613-20500 | 2 |
| 3. Hi-density injector turret kit | G2306-60500 | 1 |
| 4. Injector turret-standard | G1513-40000 | 1 |
| 5. Needle support assembly, 530 μm | G2613-60977 | 1 |
| 6. Needle support assembly, 250/320 μm (accessory 18599T) | G1513-61295 | 1 |
| NS Software upgrade kit | G2613-60550 | — |
| NS Injector install instructions | G2613-90195 | — |

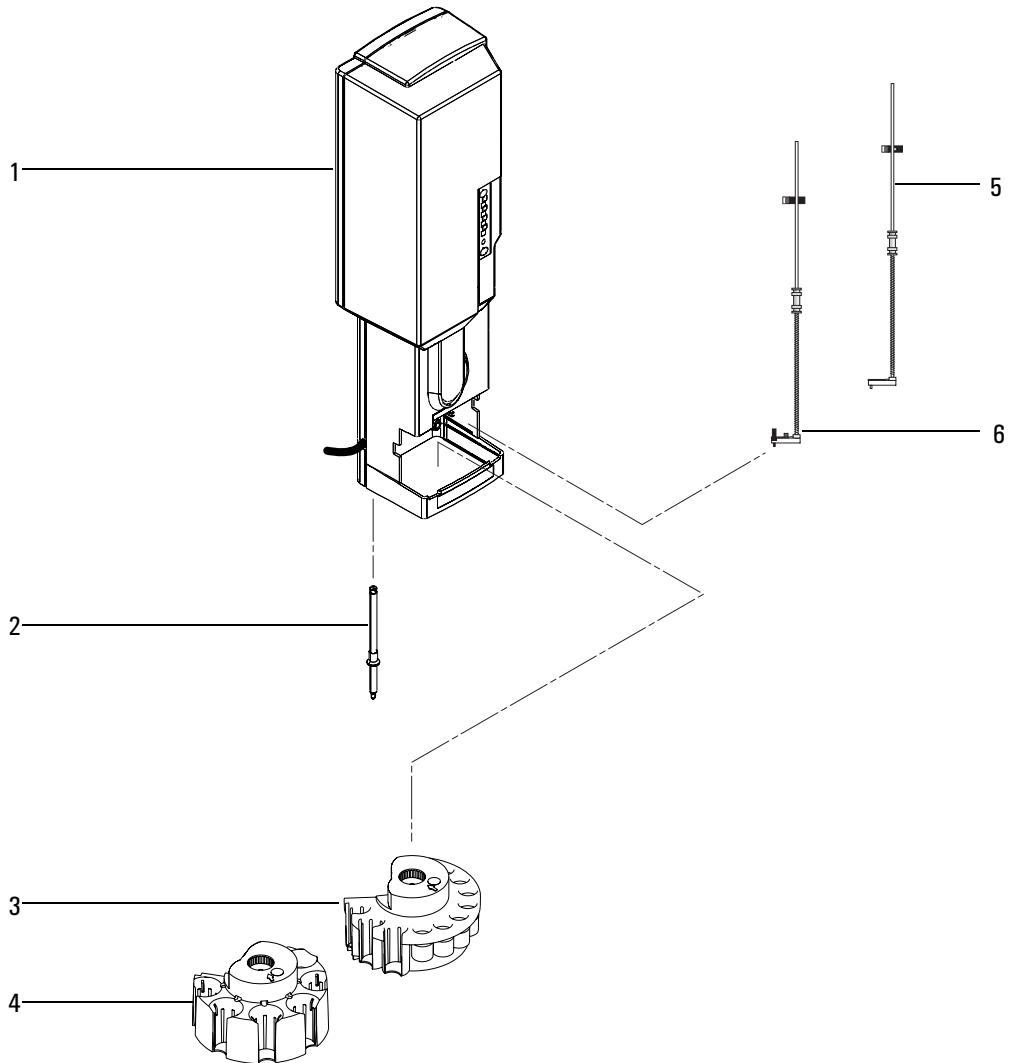


Figure 9 G2613A injector replacement parts

Illustrated Parts Breakdown
Tray, part no. G2614A

Tray, part no. G2614A

| | Description | Part No. | Qty/Assy |
|----|---------------------------------|-----------------|-----------------|
| 1. | Tray module assembly (new) | G2614-60965 | — |
| | Tray module assembly (exchange) | G2614-69965 | — |
| 2. | Torx screw, T-20, m4 × 45 mm | 0515-2484 | 2 |
| 3. | Quadrant/ 4pk | 18596-40015 | 1 |
| 4. | Torx screw, T-20, m4 × 20 mm | 1390-1024 | 1 |
| NS | Main tray cable | G2614-60610 | 1 |

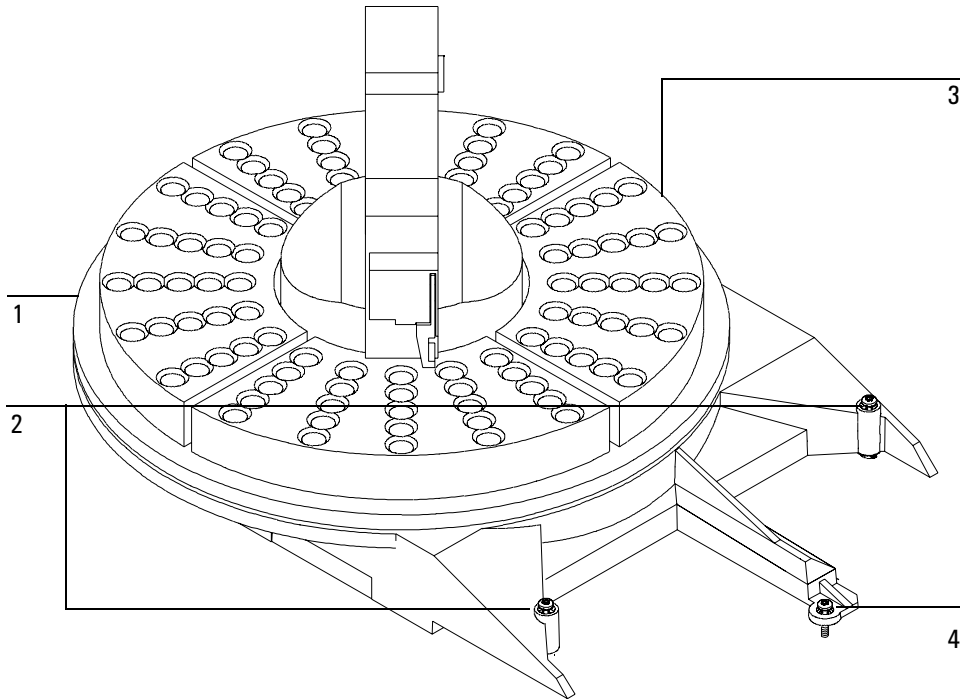


Figure 10 G2614A Tray replacement parts