

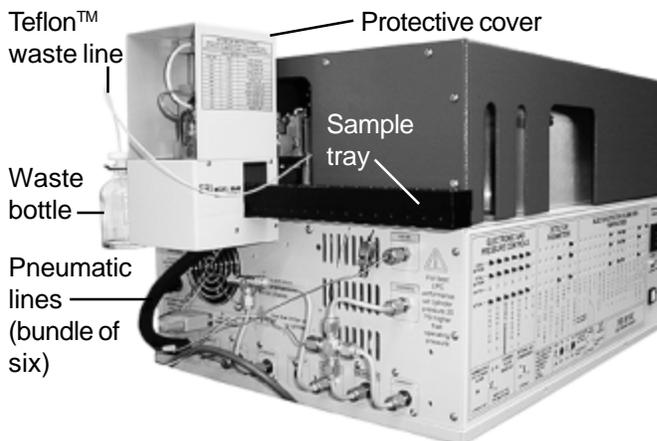
GC INJECTORS

Model 8640 20-Vial Integrated Liquid Autosampler

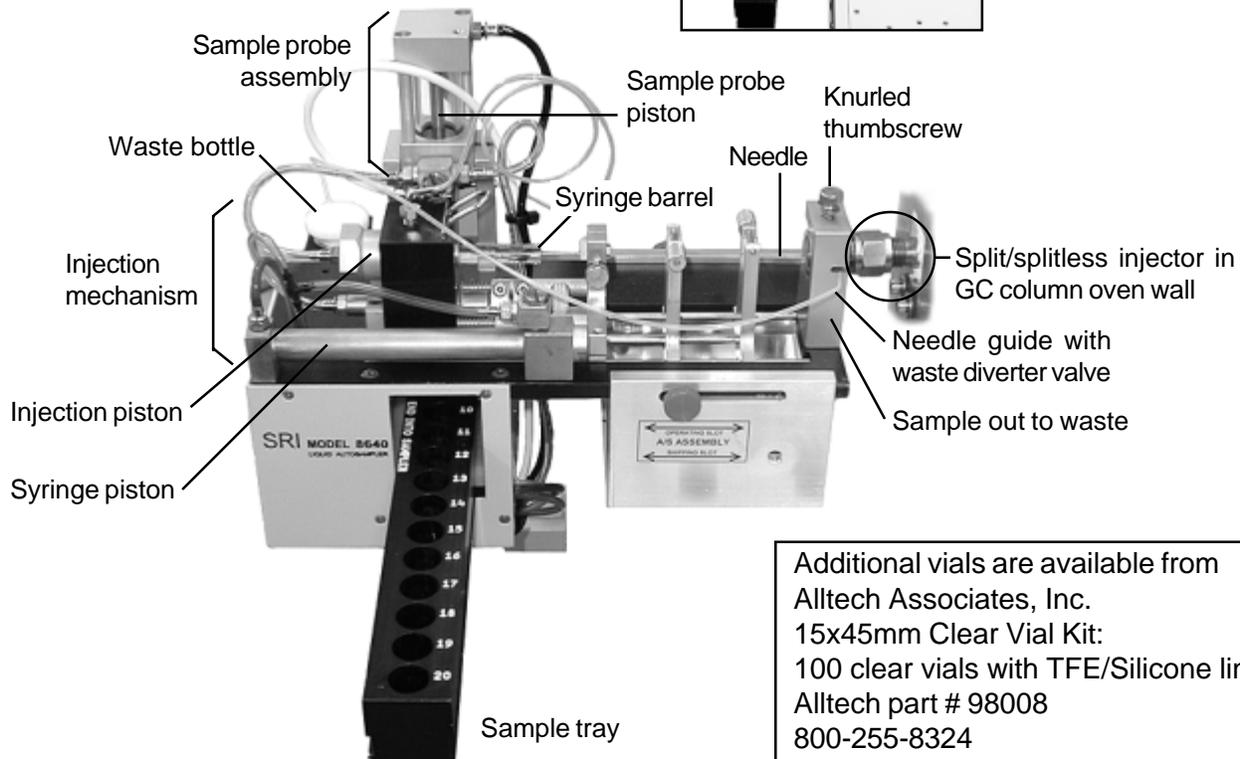
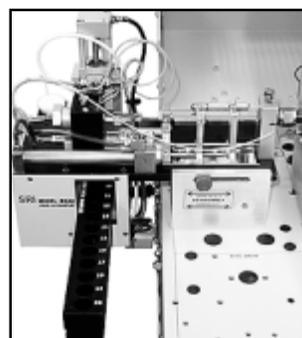
Overview

The SRI Model 8640 20-vial liquid autosampler is installed on the left-hand side of the SRI 8610C GC. The 8640 connects to an additional injector on the left side of the column oven. This additional injector may be on-column, heated, or split/splitless. It uses a sample tray to hold up to twenty 2mL vials, a sample probe to transfer the sample from the vials into the syringe barrel, and an injection mechanism to deliver the sample from the syringe barrel, through the needle, into the injector in the GC column oven wall. The 8640 uses 60psi of air or nitrogen to actuate its moving parts. The 8640 functions are assigned relays so that the autosampler may be operated automatically using a PeakSimple event table.

The 8640 is shipped with 100 screw-top vials and septa, replacements for which are available from a variety of suppliers. Extra sample trays and cooled sample trays are available. The cooled sample trays require an external refrigerated lab circulator.



8640 with the protective cover removed



Additional vials are available from Alltech Associates, Inc.
 15x45mm Clear Vial Kit:
 100 clear vials with TFE/Silicone liners
 Alltech part # 98008
 800-255-8324
www.alltechweb.com

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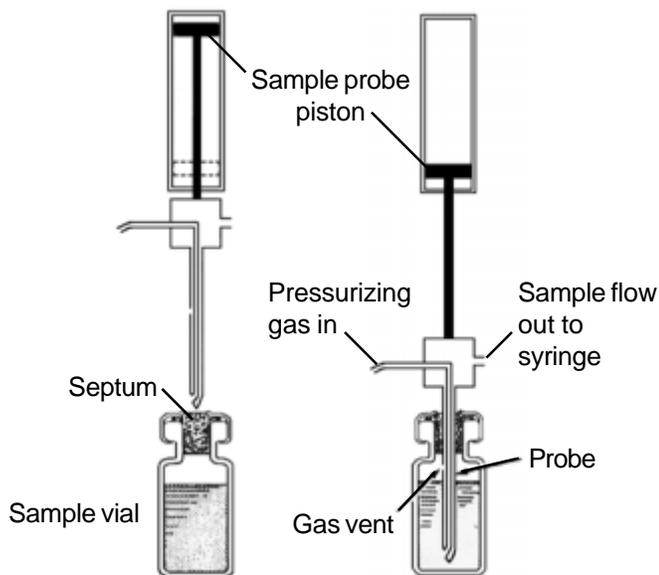
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Theory of Operation

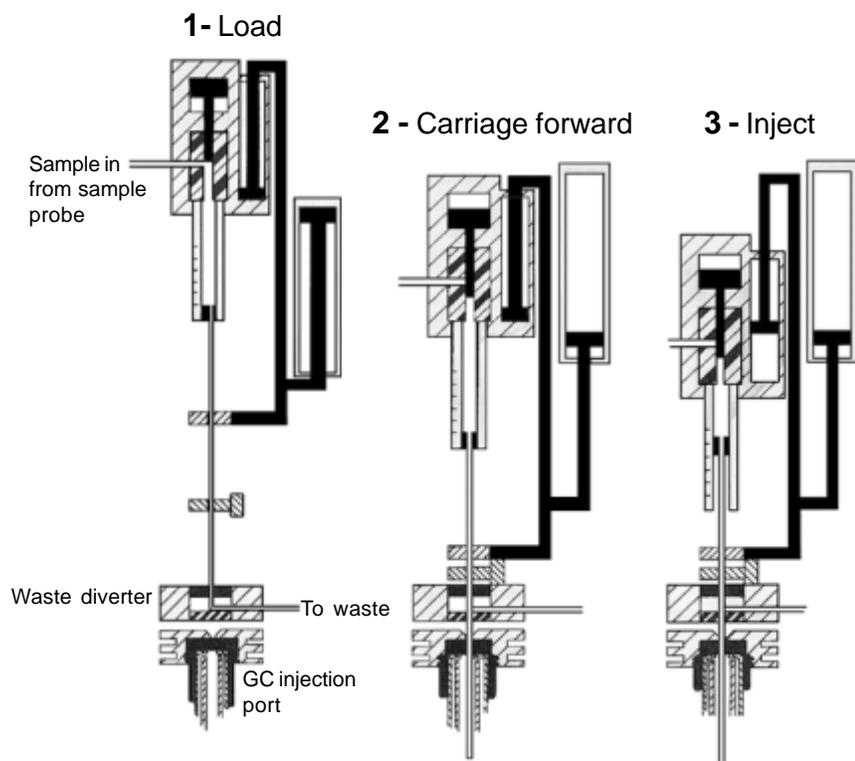
Liquid sample is sealed into vapor-tight vials which are inserted into the sample tray. The tray is then inserted into the Model 8640 assembly and positioned for the sampling sequence. The 8640 uses 60psi of air or nitrogen to actuate its moving parts.

The sampling probe, a concentric needle, is moved down by a piston to pressurize the vial with helium or other gas, causing sample to flow through the injection syringe and out the Teflon™ tubing into the waste bottle. The sample probe pressurizes the sample vial for a period of time long enough to rinse the previous sample to waste and fill the syringe with sample.

Sampling Probe Sequence



Injection Sequence



The syringe mechanism begins the process in the fully retracted position (1). In this position, the sample flows through the barrel of the injection syringe, through the needle to the waste diverter valve and into the waste bottle. After approximately 0.5mL of sample is flushed to waste, the syringe barrel is filled with sample. The syringe mechanism is then moved forward by a piston, so that the syringe needle penetrates the waste diverter seal, then the GC injection port septum (2). Once the injection needle has penetrated the GC injection port to the full depth, the syringe body is pushed forward over the needle, displacing the sample into the injection port (3). Once the sample has been injected, the syringe mechanism retracts, withdrawing from the GC injection port.

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General Operating Procedures

1. Fill each 2mL vial at least 75% full with liquid sample. Close the vials so that they are vapor-tight, with the Teflon side of the vial septa facing downward into the vial.
2. The sample tray is inserted and removed from the 8640 in one direction only. To remove the sample vial tray, push it away from you, toward the back of the GC, until it is free of the autosampler assembly. Place the filled sample vials in the tray. Reinsert the sample tray into the 8640 assembly from the front. Push it gently toward the back of the GC until the white lines at the tip of the white arrow on the sample tray are aligned with the front edge of the 8640. The sample tray is then in the ready position, with vial number one in place under the sample probe. The sample tray shown below, right is almost in the ready position (it was left partially out for visibility of the lines and arrow).



3. Activate and heat the GC detector(s).
4. Load or create a column oven temperature program.
5. Load or create an event table. Version 2.74 (and higher) of the PeakSimple software includes an event table file called "8640as.evt" as a general event table for use with the 8640 autosampler. When you load this event file, the default relay descriptions will not match the actual 8640 autosampler relay descriptions. These autosampler-specific descriptions must be entered by you, the user. The relays assigned to the autosampler are as follows:

- Relay A - moves the sample probe DOWN
- Relay B - moves the sample probe UP
- Relay C - moves the syringe carriage FORWARD
- Relay D - INJECTS the contents of the syringe
- Relay E - ADVANCES the tray one position
- Relay F - PRESSURIZES the sample vial

WARNING!
To avoid injury, keep your hands clear of the 8640 during operation.

See the event table shown at right for appropriate descriptions. The 8640 relay descriptions are also labeled on the right-hand side of the GC.

6. Set the autosampler air or nitrogen tank to 60psi. Set the carrier gas to 10mL/minute (the equivalent psi setting for your machine is labeled on the right panel of the GC). The amount of sample used to flush the needle can be adjusted by varying the pressure of the gas used to force the sample from the vial. This gas pressure is adjusted with the EPC trimpot on the top edge of the GC's front control panel, located directly above the vertical label "VIAL PRESSURE" on the front control panel. Using the event table at right, you should count 25 drops during the time that the gas is pressurizing the sample (0.600 minutes).

8640.evt		
EVENT TIME	EVENT	EVENT FUNCTION
0.000	ZERO	Zero data system signal
0.050	A ON	Sample probe DOWN
0.100	F ON	Vial pressure ON (pressurize the sample vial)
0.650	A OFF	Release pressure holding sample probe DOWN
0.700	F OFF	Vial pressure OFF
0.750	B ON	Sample probe UP
0.800	C ON	Syringe carriage FORWARD
0.850	D ON	Sample syringe INJECT
1.000	C OFF	Syringe carriage RETRACT
1.050	D OFF	Sample syringe RETURN
1.100	E ON	Tray advance ON
1.200	E OFF	Tray advance OFF
1.300	B OFF	Release pressure holding sample probe UP

7. The injection volume is factory set at 1μL, but is adjustable to 0-3μL. Loosen the 2 hex-head lock nuts, then turn the knurled nut while observing the needle in the syringe barrel to achieve the desired injection volume (please see the picture on the **Changing the Needle** page to locate the lock nuts and knurled nut).

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Changing the Needle

In the course of normal operation, the 8640 sample injection needle may become bent or otherwise damaged and require replacing. Make sure the syringe mechanism is fully retracted before starting; this is the default position to which it should return after a sample injection sequence.

Replacement needles are available from Central Instruments under part number 502743. Syringe barrel and needle sets are available under part number 503188. Call Central Instruments at:

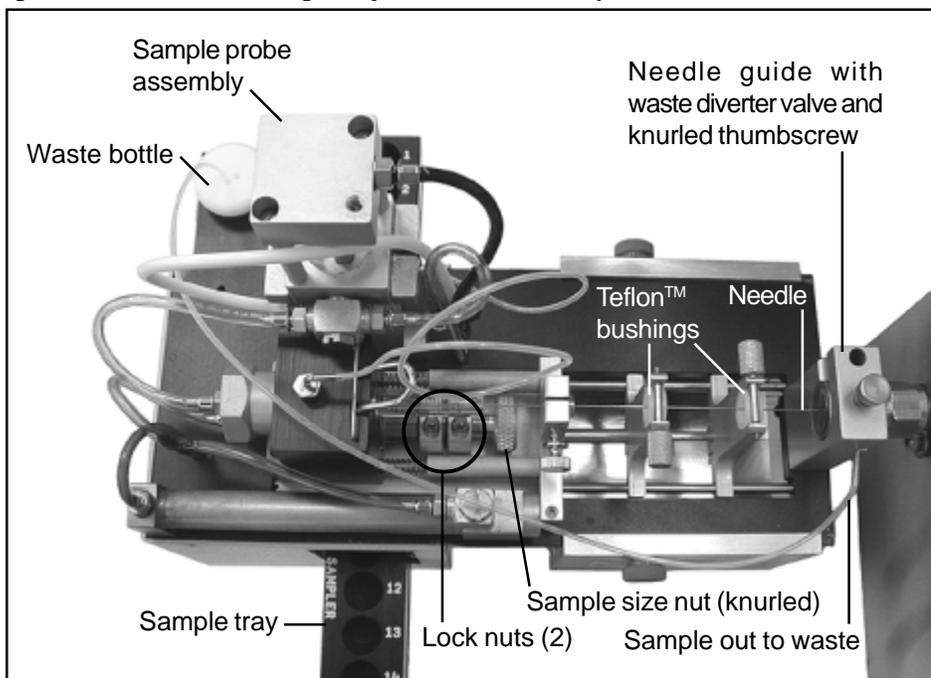
225-261-1917

Or write to:

P.O. Box 337

Greenwell Springs, LA 70739

USA.



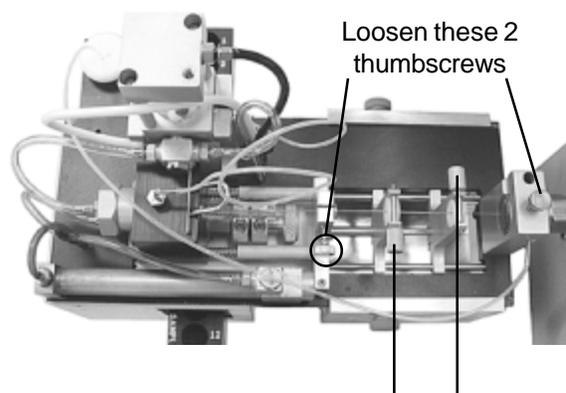
1. To remove the needle, loosen the thumbscrew on the top of the waste diverter and the thumbscrew on the needle guide closest to the syringe barrel. Loosen and remove the two bushing retainers. Carefully lift out the needle, the two Teflon™ bushings and the waste diverter valve together. You will have to push the waste diverter valve out of the needle guide, and angle the needle tip out through the slot in the side of the waste diverter needle guide as you pull the needle from the syringe barrel.

2. Slide the waste diverter valve and the two Teflon™ bushings off the old needle and onto the replacement needle.

3. Place the needle into the thumbscrew needle guide and the syringe barrel, and carefully angle the needle with the bushings and waste diverter valve into place, using the slot in the waste diverter needle guide to get the tip of the needle into alignment with the syringe barrel.

4. Position the two bushings in their cradles, then replace and tighten the bushing retainers. Tighten the thumbscrews on the needle guide and waste diverter.

5. Adjust the sample injection volume by loosening both hex-head lock nuts, then turning the knurled thumbscrew to achieve the desired volume. Tighten the lock nuts.



Loosen and remove these 2 bushing retainers, then remove the 2 bushings