FORENSIC TOXICOLOGY LABORATORY
OFFICE OF CHIEF MEDICAL EXAMINER
NEW YORK CITY

GC ROUTINE MAINTENANCE
AGILENT 6890

TANK REPLACEMENT

A gas tank requires replacement when the high pressure gauge reads 500 psi or less.

Materials

A weak soap solution in a squeeze bottle ("Snoop")

Crescent wrench that can open to at least a 2-inch diameter

Procedure

1. Make sure no runs are currently in progress on any GC using the tank.
2. Turn off gas tank at valve.
3. Using the Crescent wrench, loosen the large nut connecting the gas gauge and the tank outlet. Remove the gas gauge.
4. Place a steel protective cap onto the empty gas tank. Remove the tank restraints and place the empty tank to one side. Label it "Empty".
5. Move a new, full tank into place and secure it with the tank restraints. Replace the gas gauge inlet into the tank outlet and tighten the nut using the wrench. Open the new tank.
6. Check all joints and connections with the snoop. The presence of growing soap bubbles indicates a gas leak. Tighten or replace all joints and connections as necessary.
7. Restore gas flow and check all affected GCs. Reset GC's to operating conditions.
8. As appropriate, adjust the bead power before use.
9. Return all tools to their proper location.

SEPTA REPLACEMENT

A septum in the GC requires replacement when a significant change in the retention time of known peaks in any given control occurs. As a practical matter, it is recommended that the septum be changed weekly or after approximately 100 injections.

Materials

Replacement green septum (11mm diameter)

Lint-free gloves

Septum nut angled wrench

Tweezers

Procedure

1. Set GC inlet temperature to 50 ^{0}C, turn off inlet pressure. Wait until the inlet temperature fall below 100 °C. Oven temperature is 120 ^{0}C.
2. Remove autosampler tower and store safely.
3. Remove the septum nut with the appropriate wrench.

   CAUTION: *SEPTUM NUTS MAY BE HOT!*

   Use lint-free gloves to protect from burns.

4. Remove the old septum from the septum seat using the tweezers. Discard the old septum. If required, use the tweezers to remove old septum debris from where it sits.
5. Install a new septum using the tweezers. Replace and tighten the septum nut. Don't over tighten the septum nut as it will expand due to injection port heating.
6. Replace the tower, restore the inlet temperature. Record this maintenance in the GC maintenance log for the GC. Initial and date the maintenance log.
7. Return all tools to their proper locations.

INJECTION PORT LINER REPLACEMENT

Injection port liners with glass wool plugs are purchased from Supelco (or equivalent). The liners are changed when a drug contained in either a calibrator or control has poor recovery that consists of tailing or broadening of its usual peak shape.

Materials

Clean glass liner: Split/Splitless Injection Sleeve (4mm ID) packed with deactivated glass wool

Graphite O-ring (6.35mm ID; 9.63mm OD)

Lint-free gloves

Septum nut angled wrench

Cotton swabs

Tweezers

Procedure

1. Set GC inlet temperature to 50 ^{0}C, turn off inlet pressure. Wait until the inlet temperature fall below 100 °C. Oven temperature is 120 ^{0}C.
2. Find the septum nut angled wrench; loosen the larger nut beneath the septum nut (the 22mm hexagonal injection port nut).
3. Once the nut is free of the threading, gently move the housing aside. Be extremely careful not to snap or bend the tubing connected to the nut.
4. Remove existing graphite O-ring. Using the tweezers, gently remove the glass liner from the injection port. *Do not remove liner at an angle as it can break and loose glass can particles can remain in the inlet.*
5. Get a clean, glass liner; using the wood end of a cotton swab, push the glass wool plug to the proper position the plug so that it is approximately 1cm from one of the ends of the glass liner.
6. Place a new graphite O-ring on the end of the liner tube. Insert the liner with plug and O-ring back into the injection port with the plug end first (to the bottom of the injection port).
7. Replace the injection port nut and tighten using the injection port nut wrench. Restore the inlet temperature and pressure to their routine operating values.
8. Test runs are performed to remove possible contaminants remaining on the glass wool, inject methanol washes followed by injections of Cal Group 1 and Group 2 at 0.2 mg/L to insure that the system is operating properly.
9. Review the test runs: check that the chromatogram does not exhibit any signs of a leak, check the recovery of the internal standard and all the drugs in the groups, insure that all drugs from each group are present and that there are no extraneous peaks. Consult test run with supervisor.
10. Record this maintenance in the GC's maintenance log, provide all necessary documentation.
11. Return all tools to their proper locations.

NPD BEAD REPLACEMENT

NPD beads require replacement after bead voltage reaches the threshold of 4.093.

Materials

NPD replacement bead (Agilent part#G1534-60570)

Lint free gloves

Allen wrench (1 mm)

Torx screwdriver, T-10

Procedure

1. Set bead voltage to 0.0 volts. Set detector temperature to 150^0 C. turn off gases to detector. Allow to cool to 150^0 C. Oven will shut down once door is opened.
2. Remove side covers of the GC. With the Torx screwdriver, remove the 3 screws on bead assembly (*caution: these screws will be hot)*, gently remove the bead.
3. Install the NPD Bead Assembly, each come with three new screws. Review instructions included with each new bead. Do not touch the ceramic bead, and handle bead assembly gently.
4. Replace the three screws using the Torx screwdriver. Replace the GC's covers that were removed.
5. Restore all flows and temperature to their normal operating conditions.
6. After bead flows and temperature stabilize, using the keypad on the instrument scroll to the "adjust offset" for the replaced detector and select the "on" button. The newly installed NPD bead will adjust itself until the bead is ready to be used. Once this process is complete, the instrument will turn the "adjust offset" off, then adjust the bead voltage to 3.600 volts.
7. The new bead is extremely sensitive and if used right away may cause carryover issues when injecting extracted cases. To lower the output of the bead, make multiple injections of methanol, followed by multiple injections of a Cal Groups 1 and 2 at 0.2mg/L. Evaluate injections for response of all the compounds, consult test runs with supervisor.
8. Record this maintenance on the GC maintenance log for the GC. Record this maintenance in the GC's maintenance log, provide all necessary documentation.
9. Return all tools to their proper locations.

REFERENCES

Agilent 6890 GC System Installation Guide.

Agilent 6890 GC System Users Guide.

Agilent 6890 GC System Standard Operating Procedures.

Agilent 6890 GC System Instruction Guide Replacing the NPD Bead.