

O P E R A T I N G M A N U A L



HAPSITE[®]

Service Module

PN 074-509-P1C



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**DECLARATION
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CONFORMITY**

This is to certify that this equipment, designed and manufactured by:

**INFICON Inc.
Two Technology Place
East Syracuse, NY 13057
USA**

meets the essential safety requirements of the European Union and is placed on the market accordingly. It has been constructed in accordance with good engineering practice in safety matters in force in the Community and does not endanger the safety of persons, domestic animals or property when properly installed and maintained and used in applications for which it was made.

In addition, this is to certify that this equipment has also been designed and manufactured having regard to the state of the art, to ensure compliance with the Protection Requirements of EMC directive 2004/108/EC.

A Technical Documentation File is also available for review by competent authorities and will be maintained for a period of ten years after the date on which the equipment was last manufactured. In addition to this file, technical, installation, maintenance and application information concerning this equipment can also be found in the Operating Manual(s) for this product or product family.

Equipment Description: HAPSITE ER Portable GC/MS with wireless communications, including the HAPSITE Service Module, NEG Pump, Battery and AC to DC HAPSITE Adapter, Headspace Accessory, Situ-Probe Accessory, SPME and Thermal Desorber Accessory.

Applicable Directives: 2014/35/EU (LVD)
1999/5/EC (R&TTE / EMC)
(The required compliance statement concerning this directive can be found in Chapter 4 of this manual.)
2014/30/EU (General EMC)
2011/65/EU (RoHS)

Applicable Standards:

Safety: EN 61010-1:2010 3.0 Edition

Emissions: ETSI EN 300 328 v1.8.1 (2.4 GHz)
(ERM for equipment operating in the 2.4 GHz ISM band)
ETSI EN 301 893 v1.7.1 (5 GHz)

EN 61326-1: 2013 (Radiated & Conducted Emissions)
(EMC – Measurement, Control & Laboratory Equipment)

CISPR 11/EN 55011 Edition 2009-12 Emission standard for industrial, Scientific and medical (ISM) radio RF equipment

FCC Title 47 Part 18 Class A emission requirements (USA)

Immunity: EN 61326:2013 (Industrial EMC Environments)
(EMC – Measurement, Control & Laboratory Equipment)
Immunity per Table 2

ETSI EN 301 489-17 V2.2.1: 2012 (General EMI)
(ERM - EMC - Specific conditions for 2.4 GHz)

RoHS: Due to the classification of this product it is currently exempt from the RoHS
directive until 2017.

Wireless Restrictions:

Countries	Restrictions
France	Outdoor use limited to 10mW e.i.r.p. within the band 2454 to 2483.5 MHz.
Italy	If used outside of own premises, general authorization is required.
Luxembourg	General authorization is required for public service.
Romania	On a secondary basis. Individual license required.
Austria, Denmark, Finland, Germany, Greece, Iceland, Ireland, Liechtenstein, Luxembourg, The Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, The United Kingdom	None

CE Implementation Date: July 18, 2008, Revised June, 2015

Authorized Representatives:

Jerry Wander

Stephen Chabot



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INFICON Inc.



Vice-President, Operations and Quality
INFICON Inc.

Warranty

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No warranty is made by Seller of any Seller product which has been installed, used or operated contrary to Seller's written instruction manual or which has been subjected to misuse, negligence or accident or has been repaired or altered by anyone other than Seller or which has been used in a manner or for a purpose for which the Seller product was not designed nor against any defects due to plans or instructions supplied to Seller by or for Buyer.

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NOTE: These instructions do not provide for every contingency that may arise in connection with the installation, operation or maintenance of this equipment. Should you require further assistance, please contact INFICON.



Table Of Contents

	Cover Page	
	Trademarks	
	Disclaimer	
	Copyright	
	Declaration Of Conformity	
	Warranty	
Chapter 1	Manual Use and General Safety	
1.1	General Safety	1-1
1.2	Using This Manual	1-2
1.2.1	Symbols and Their Definitions	1-2
1.3	How To Contact INFICON	1-3
1.3.1	Returning the HAPSITE Service Module	1-3
Chapter 2	Specifications	
2.1	Physical Specifications	2-1
2.2	Operating Specifications	2-1
Chapter 3	Overview	
3.1	Introduction	3-1
3.2	Service Module Component Overview	3-2
3.2.1	UPS (Backup) Batteries	3-4
3.2.2	Load Lock Assembly	3-5
3.3	Communications	3-6
3.4	Service Module Power Input	3-7
3.4.1	AC Power Input	3-7
3.4.2	24 V (dc) Input Supply	3-7
Chapter 4	Service Module Operation	
4.1	When to Use the Service Module	4-1
4.2	Using the Service Module	4-2
4.2.1	Setting Up the Service Module	4-2

Chapter 5

Attaching and Detaching HAPSITE

5.1	O-ring Cleaning and Inspection	5-1
5.2	Placing HAPSITE on the Service Module.	5-2
5.3	IQ Software for the Service Module	5-4
5.3.1	Service Module Tab on Properties Window	5-5
5.4	Starting Up HAPSITE on the Service Module	5-9
5.5	Attaching HAPSITE to the Service Module	5-10
5.5.1	Attaching HAPSITE to the Service Module Using IQ Software	5-11
5.5.2	Attaching the HAPSITE to the Service Module using the HAPSITE Front Panel Controls	5-13
5.6	Detaching HAPSITE	5-16
5.6.1	Using IQ Software to Detach	5-16
5.6.2	Using the Front Panel Display to Detach	5-19
5.7	Physically Removing HAPSITE from the Service Module	5-21

Chapter 6

Service Module Storage and Maintenance

6.1	Introduction	6-1
6.2	Cleaning the O-ring	6-1
6.3	Installing Aluminum Cap.	6-1
6.4	Pump Down Procedure	6-2
6.5	Routine Maintenance	6-4
6.5.1	Replacing the O-ring.	6-5

Chapter 1

Manual Use and General Safety

1.1 General Safety

**WARNING**

Only technically qualified personnel should perform the procedures described in this manual.

**WARNING - Risk Of Electric Shock**

Potentially lethal voltages are present within the Service Module whenever it is connected to power.

**WARNING**

Failure to operate the Service Module in the manner intended by INFICON can circumvent the safety protection provided by the instrument and may result in personal injury.

**CAUTION**

Heavy Object over 18 kg - To avoid muscle strain or injury, use mechanical lifting aides and proper lifting techniques. Get help when required.

1.2 Using This Manual

1.2.1 Symbols and Their Definitions

When using this manual, please pay attention to the Notes, Cautions, and Warnings found throughout. For the purposes of this manual they are defined as follows:

NOTE: Pertinent information that is useful in achieving maximum HAPSITE Service Module efficiency.



CAUTION

Failure to heed these messages could result in damage to the HAPSITE Service Module.



WARNING

Failure to heed these messages could result in personal injury.



WARNING - Risk Of Electric Shock

Dangerous voltages are present which could result in personal injury.

1.3 How To Contact INFICON

Worldwide customer support information is available under Support at www.inficon.com to contact:

- ◆ a Technical Support Engineer with questions regarding applications for and programming the HAPSITE
- ◆ a Service Engineer with questions regarding troubleshooting, diagnosing or repairing a defective HAPSITE Service Module
- ◆ Sales and Customer Service, to find the nearest INFICON Sales office
- ◆ Repair Service, to find the nearest INFICON Service Center

If experiencing a problem with the HAPSITE Service Module, please have the following information readily available:

- ◆ the serial number and firmware version for the HAPSITE Service Module
- ◆ a description of the problem
- ◆ an explanation of any corrective action already been attempted
- ◆ and the exact wording of any error messages received

1.3.1 Returning the HAPSITE Service Module

Do not return any component of the HAPSITE Service Module to INFICON without first speaking with a Customer Support Representative and obtaining a Return Material Authorization (RMA) number.

Packages to INFICON without an RMA number will be held until the customer is contacted. This will result in delays in servicing the HAPSITE Service Module.

Chapter 2

Specifications

2.1 Physical Specifications

Weight	20 kg (45 lb.)
Dimensions (LxWxH)	46 x 43 x 22 cm (18 x 17 x 8.5 in.)

2.2 Operating Specifications

Vacuum System	Molecular drag/turbo pump with oil free backing pump
Software	HAPSITE IQ Software

Power

Power	100-240 V (ac) 50/60 Hz; 332 VA
Temporary Overvoltages	Short Term: 1430 V, <5 s
Long Term:	480 V, >5 s

Operating Environment

Usage.	Indoor only
Temperature	5 to 35°C (41-95°F)
Humidity	Up to 85% RH, non-condensing
Altitude	Up to 2000 meters
Installation (Overvoltage)	Category II per IEC 60664
Pollution Degree.	2 per EN 61010

Storage Temperature

Storage Temperature	-10 to 60°C (14 to 140°F)
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Chapter 3

Overview

3.1 Introduction

The Service Module (SM) provides support functions for the HAPSITE Chemical Identification System. It is compatible with all HAPSITE models.

- ◆ The Service Module contains pumps that create vacuum for the HAPSITE manifold, both during GC/MS operation and non-evaporable getter (NEG) pump activation.
- ◆ The Vacuum Interconnect (VI) valve between HAPSITE and the Service Module is opened and closed by the Load Lock via the software.
- ◆ A 24 V (dc) power supply in the Service Module provides HAPSITE with power.
- ◆ The Service Module also contains backup batteries to provide power during a controlled shutdown of the system if power is lost.

The Service Module operates using two pumps, a Roughing Pump and a Turbo Pump.

The Roughing Pump works in series with the Turbo Pump to create a vacuum (typically about 1×10^{-03} to 3×10^{-03} Pa pressure) which is suitable for operating the HAPSITE Mass Spectrometer.

The Roughing Pump starts first to create the vacuum and will remain running.

Once there is sufficient vacuum, the Turbo Pump will start to further reduce the pressure.



CAUTION

Damage to the Turbo Pump may result from moving the Service Module while the pump is operating.



CAUTION

The Service Module is not water resistant and is not designed to withstand decontamination

3.2 Service Module Component Overview

Figure 3-1 and Figure 3-2 depict the basic internal layout of the Service Module (PN 930-202-G1).

The components of the Service Module, their basic operations, and the service they provide to support HAPSITE are described in the following sections.

Figure 3-1 Top view

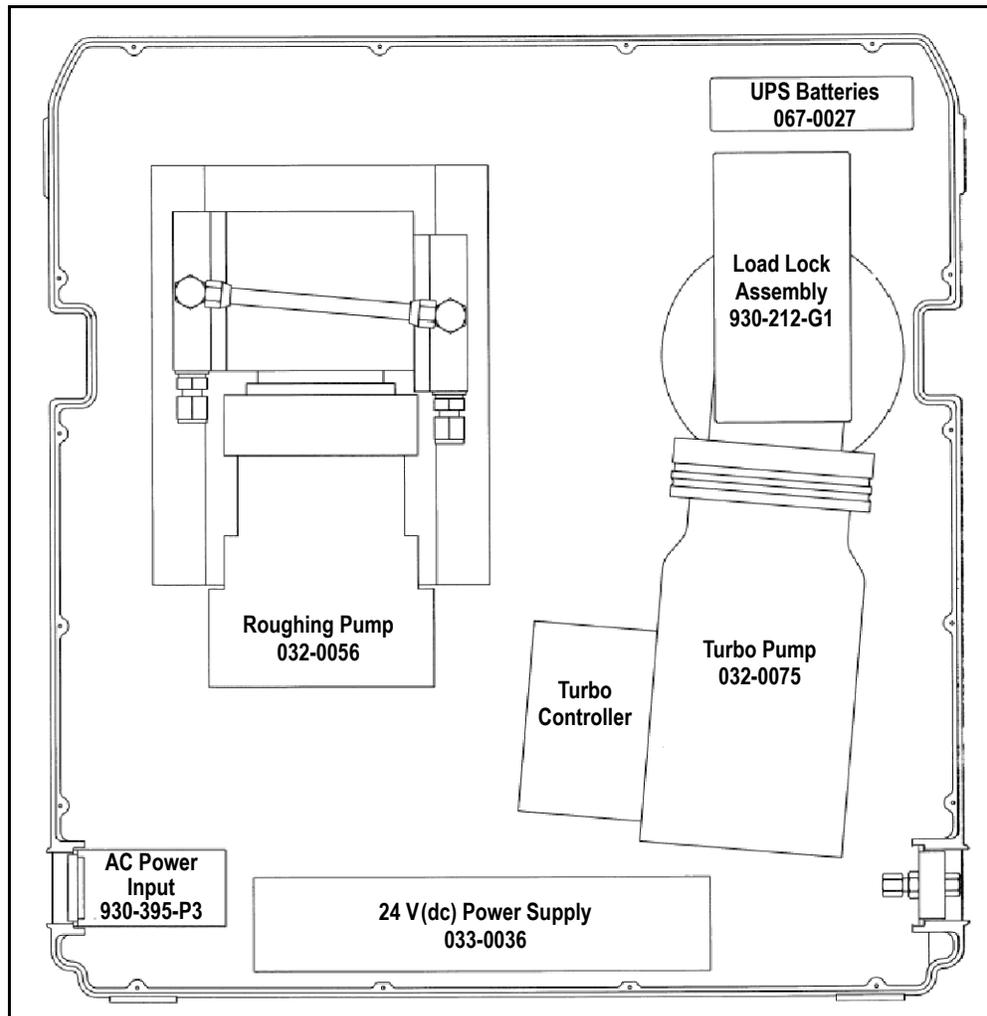
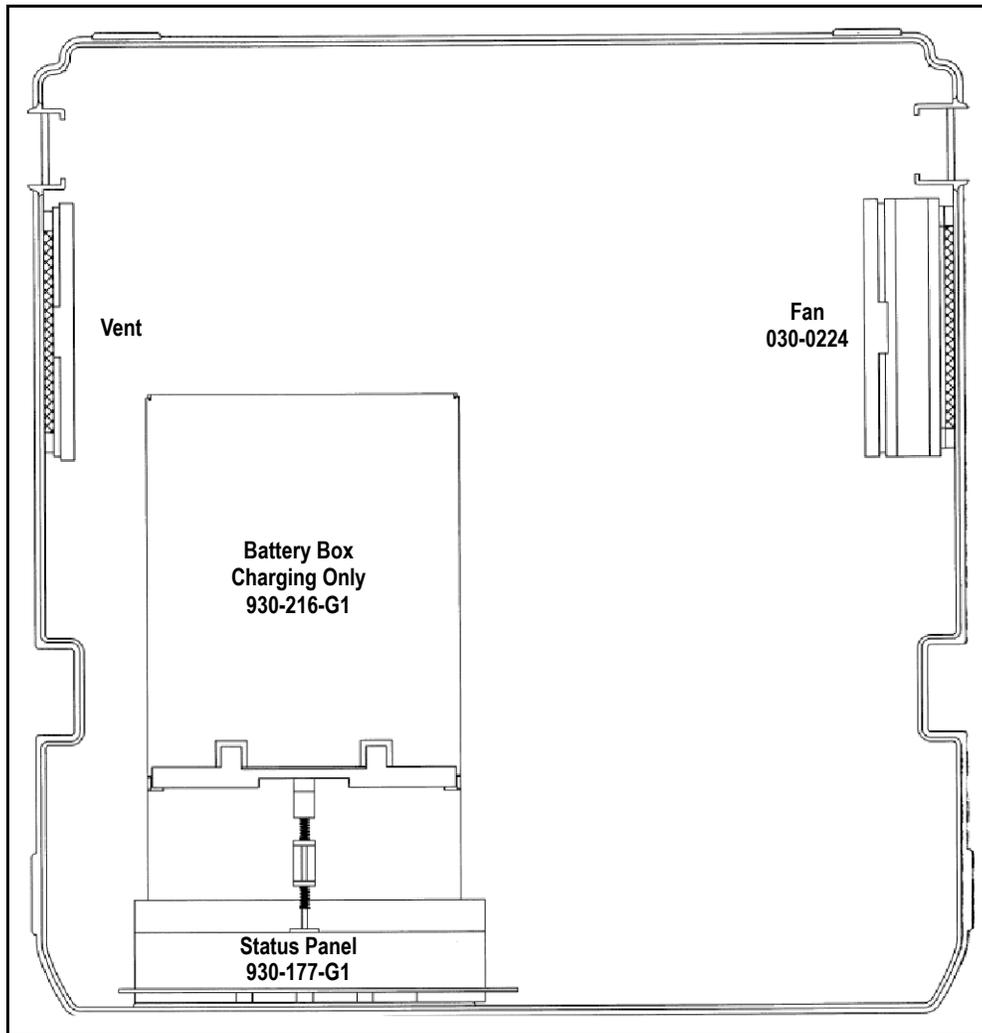


Figure 3-2 Bottom view



3.2.1 UPS (Backup) Batteries

The Service Module contains two 12 V(dc) lead-acid gel-cell backup batteries which provide 24 V(dc). When power is lost, they provide power required for a controlled shut down of the Service Module including:

- ♦ closing the Vacuum Interconnect valve (if necessary)
- ♦ venting the Service Module manifold
- ♦ shutdown of the electronics

The shutdown procedure takes about thirty seconds, during which the **POWER** indicator on the Service Module display will remain illuminated.



CAUTION

After a power loss, all operations that were interrupted must be restarted by the user.

When the Service Module is manually turned off by the user, the Service Module will perform the same controlled shutdown procedure.

The Service Module backup batteries automatically charge whenever the Service Module is powered on.

3.2.2 Load Lock Assembly

The Load Lock Assembly connects the Turbo Pump and Roughing Pump with the Manifold on HAPSITE.

The Load Lock Assembly contains a motorized mechanism to open, or close, the VI (Vacuum Interconnect) valve. The VI valve separates the HAPSITE Manifold from the Service Module pumps.



CAUTION

The system will not be ready for use until a Turbo Pump speed of 1480 Hz is reached.

NOTE: Depending on the amount of water vapor (humidity) present, it may take several minutes for a dry system, or hours for an extremely wet system, for the pump speed to reach 1480 Hz.

The Turbo Molecular Pump (**TMP**) indicator on the Service Module display will illuminate **ACCL** (accelerate) when the MDP/Turbo Pump is accelerating and **NORM** (normal) when the MDP/Turbo Pump has reached 1480 Hertz.

3.3 Communications

The Service Module communicates with HAPSITE through the electrical connector on the top cover of the Service Module. This RS-485 communication port is utilized by HAPSITE and by the computer attached to HAPSITE.

There is also an RS-232 communication port on the side of the Service Module for use by service personnel.

Figure 3-3 RS-485 communication port

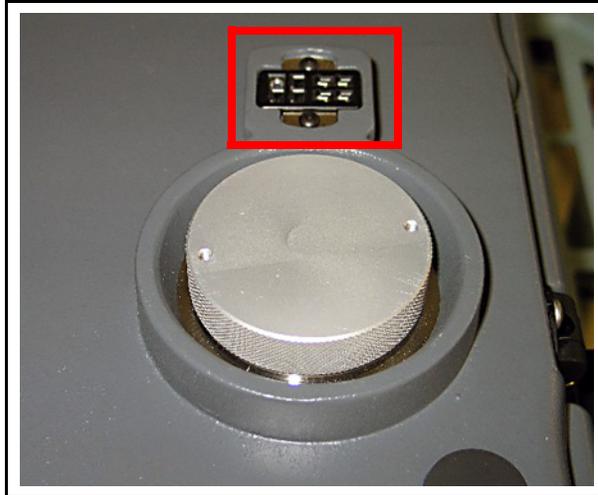
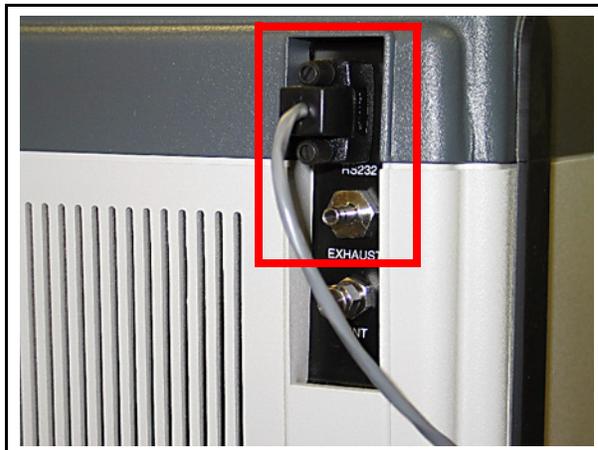


Figure 3-4 RS-232 communication cable



3.4 Service Module Power Input

Service Modules are available in either 100/240 V (ac) (PN 930-202-G1) or 24 V (dc) (PN 930-202-G3) input power models. With the exception of input power, both models are identical.

3.4.1 AC Power Input

The AC input model Service Module operates from 100/240 V (ac) line voltage. See [Figure 3-5](#).

Figure 3-5 Service Module 100 / 220 V(ac)



Chapter 4

Service Module Operation

4.1 When to Use the Service Module

The Service Module (see [Figure 4-1](#)) is used to provide vacuum for the mass spectrometer manifold in the HAPSITE Chemical Identification System.

Figure 4-1 Service Module-front and top view



CAUTION

The Service Module cannot be used in a portable application.

Never operate HAPSITE docked on a running Service Module in a moving vehicle.

The Service Module is used

- ◆ To replace NEG Pumps on-site with guidance from an INFICON service representative.

**WARNING**

To avoid personal injury, or risk damage to HAPSITE, obtain proper maintenance training before attempting to install and activate a NEG Pump.

- ◆ As an alternative or backup method to using a NEG Pump to provide vacuum for HAPSITE (i.e., the NEG Pump is not installed).
- ◆ To perform HAPSITE troubleshooting operations with guidance from an INFICON service representative.
- ◆ As an alternate power source for HAPSITE.

4.2 Using the Service Module

4.2.1 Setting Up the Service Module

Required Components

- ◆ RS-232 communication cable
- ◆ Power cord for Service Module
- ◆ Laptop with IQ Software installed

Procedure

- 1** When stored, a plastic cover is placed over the interconnect valve. The cover aids in preventing foreign debris from entering the Service Module. Remove the cover and store it in a safe location. See [Figure 4-2](#).

Figure 4-2 Plastic protective cover



- 2 Under the plastic cover is an aluminum cap. During storage, this cap prevents dust and debris from entering the Service Module. Wait until step 9 before removing the aluminum cap.

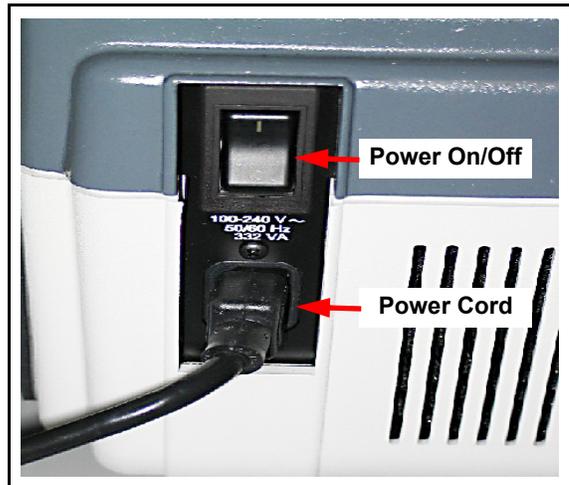
NOTE: The Service Module is shipped under vacuum from the factory with this aluminum cap in place.

Figure 4-3 Aluminum storage cap



- 3 Attach the power cord at the left back corner of the Service Module. See Figure 4-4.

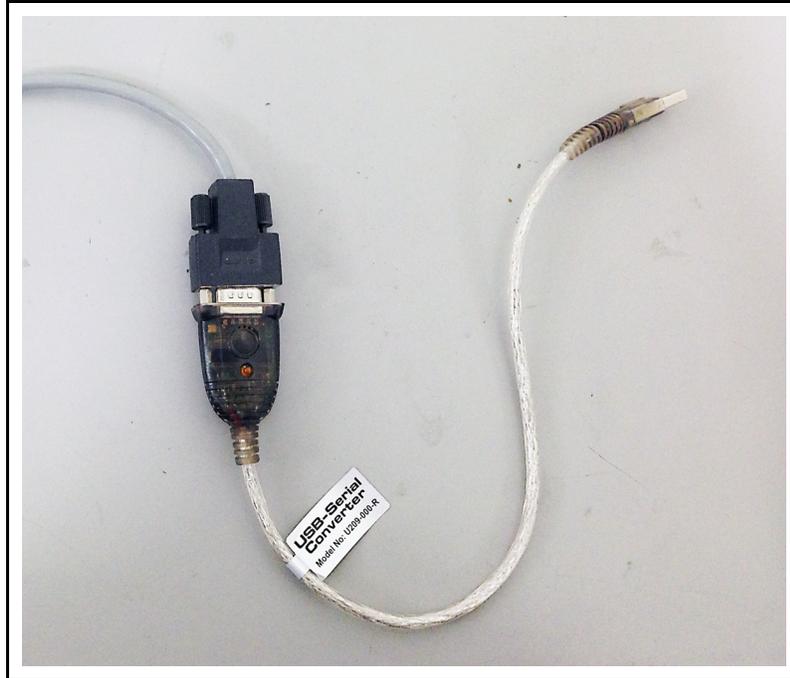
Figure 4-4 Power cord and power switch



- 4 An RS-232 cable is used to communicate with the computer. See [Figure 4-5](#).

NOTE: INFICON also provides an RS-232 to USB adapter.

Figure 4-5 RS-232 communication cable



- 5 Attach the RS-232 communications cable to the Service Module. See [Figure 4-6](#).

Figure 4-6 RS-232 Communication cable attached to back right side of service module



- 6 Attach the RS-232 cable to the computer using the USB to RS-232 adapter. See [Figure 4-7](#).

Figure 4-7 RS-232 communication cable attached to laptop using the adapter

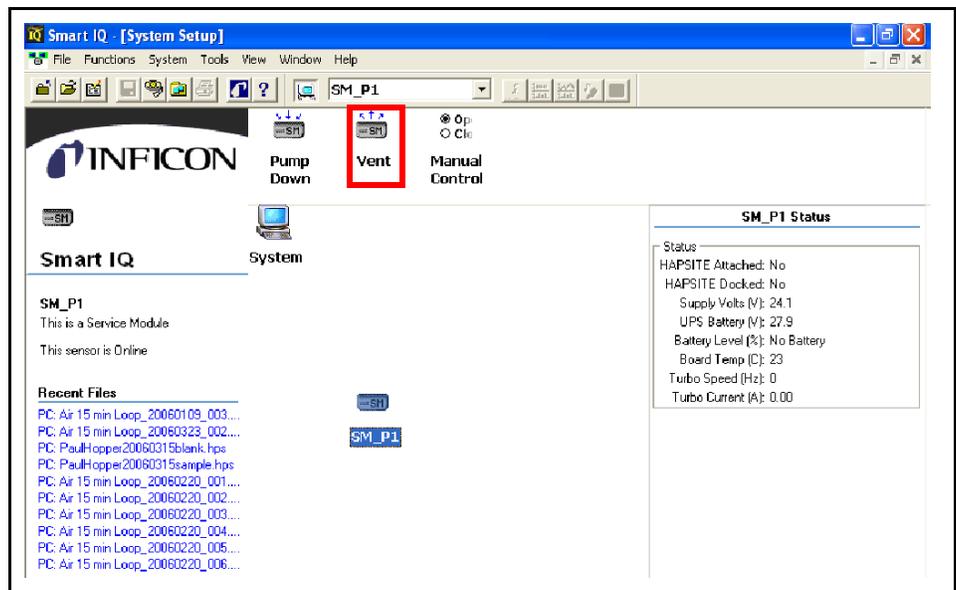


- 7 Turn on the Service Module power switch, located at the back right corner of the Service Module. Refer to [Figure 4-4](#) on page 4-3.
- 8 Turn on the computer and open IQ Software.
- 9 To prepare the Service Module for use with HAPSITE, the aluminum cap must be removed. If the Service Module is not under vacuum, the cap can be easily detached. If it is under vacuum, the cap will need to be removed using the following procedure:

NOTE: The Service Module is shipped under vacuum from the factory with this aluminum cap in place.

- 9a Click the **Vent** icon.

Figure 4-8 System setup screen with service module



- 9b** Wait for the message **Are you sure you want to vent the Service Module?** See [Figure 4-9](#).

Figure 4-9 Vent service module confirm window



- 9c** Click **Yes** to vent the Service Module. A window will display a fifteen-second countdown while the vent procedure completes.
- 9d** After the countdown reaches zero, remove the aluminum cap.

Chapter 5

Attaching and Detaching HAPSITE

5.1 O-ring Cleaning and Inspection

Cleaning will ensure a tight seal to HAPSITE, allowing the system to maintain vacuum.

- ◆ Clean debris or dust from the Viton[®] O-ring using a lint-free wipe and methanol.
- ◆ Wipe the top of the O-ring, following the contour to clean the entire top exposed section.
- ◆ Avoid pushing dust or debris into the middle opening.

Figure 5-1 shows the O-ring being cleaned.



WARNING

Wear nitrile gloves and safety glasses when handling methanol.

Figure 5-1 Cleaning the rubber o-ring using a lint-free wipe



After cleaning, look for any visible cracking of the O-ring. If the O-ring is damaged, see [section 6.5.1, Replacing the O-ring, on page 6-5](#).

Make sure the O-ring is completely seated in the groove.

5.2 Placing HAPSITE on the Service Module



CAUTION

Never operate HAPSITE docked on a running Service Module in a moving vehicle.

- 1 Remove the plastic protective cover from the bottom of HAPSITE. The cover is shown in [Figure 5-2](#). [Figure 5-3](#) shows HAPSITE with the protective cover removed.

NOTE: Store the cover in a clean, dry place, where it will be easily accessible for later use. This protective cover keeps dust and debris out of the HAPSITE manifold connection.

Figure 5-2 Plastic protective cover on the bottom of HAPSITE

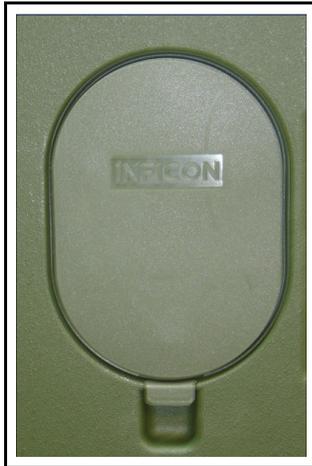


Figure 5-3 Plastic protective cover removed



- 2 Carefully place HAPSITE on top of the Service Module. The interconnect valve at the bottom of HAPSITE should be aligned with the interconnect valve on the Service Module. [Figure 5-4](#) shows HAPSITE seated on the Service Module.

Figure 5-4 HAPSITE seated on service module



- 3 Secure the Service Module to HAPSITE using the black latch at each side of the Service Module. [Figure 5-5](#) shows the right side Service Module latch.

Figure 5-5 Latch on right side



NOTE: Latches can be adjusted to the proper tension using the thumb screw.

5.3 IQ Software for the Service Module

The Service Module can be accessed in three ways on the IQ software **System Setup** window.

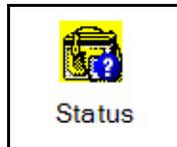
- ◆ Double-click the **Service Module** icon. See [Figure 5-6](#).

Figure 5-6 Service module icon



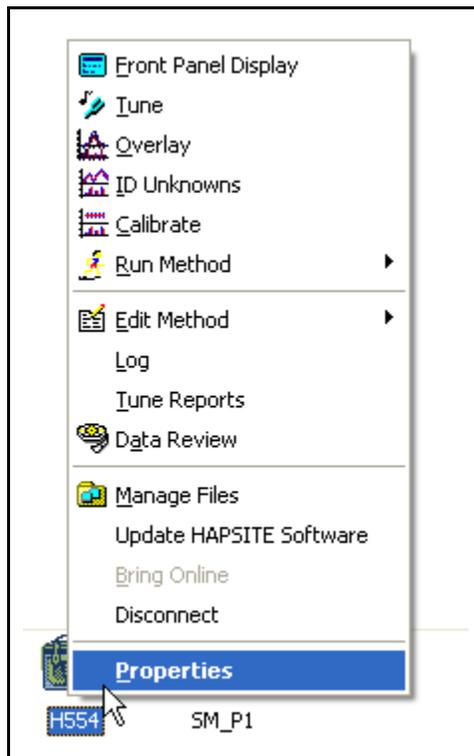
- ◆ Double-click the **Status** icon. See [Figure 5-7](#).

Figure 5-7 Status icon



- ◆ Right-click the **Sensor** icon. Then click **Properties**. See [Figure 5-8](#).

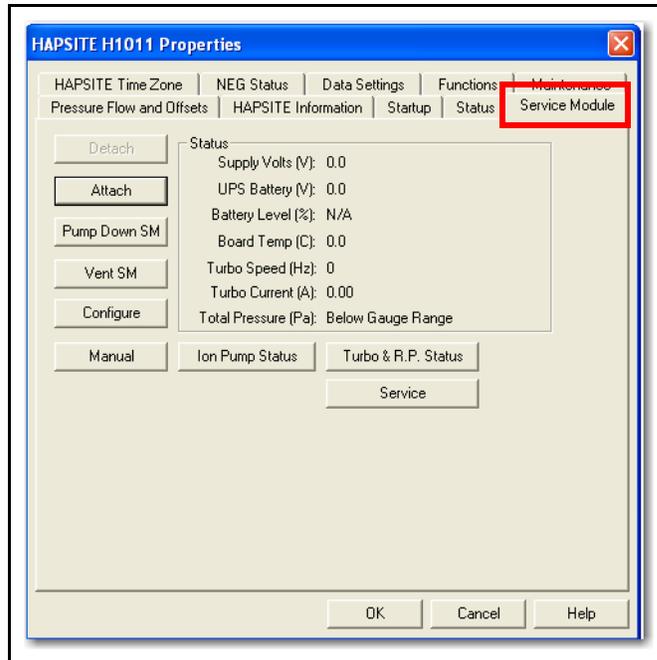
Figure 5-8 Click on properties



5.3.1 Service Module Tab on Properties Window

Click the **Service Module** tab. See Figure 5-9.

Figure 5-9 Service Module Tab in Properties Window

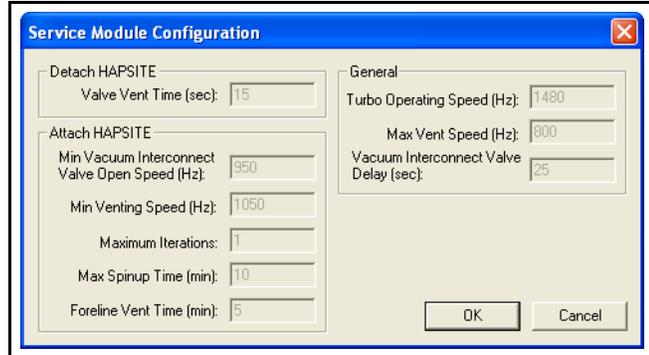


The following options are available in the **Properties** window.

- Detach** Used to release the vacuum between the Service Module and HAPSITE before physical removal. (Vacuum is maintained in the Mass Spectrometer manifold by the NEG.)
- Attach** Used to create the vacuum between HAPSITE and the Service Module. It will create and maintain vacuum within the Mass Spectrometer after physically connecting.
- Pump Down SM** Used to place the Service Module into storage.
- Vent SM** Used to take the Service Module out of storage.

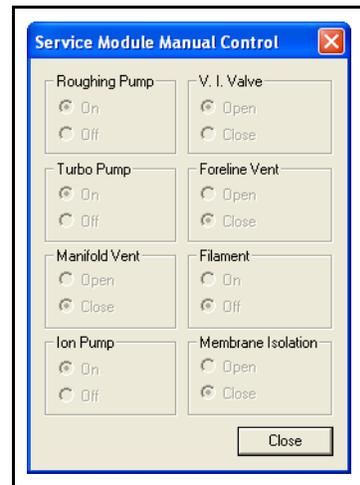
Configure Used to change the times and speeds of Service Module components. See [Figure 5-10](#).

Figure 5-10 Configuration window



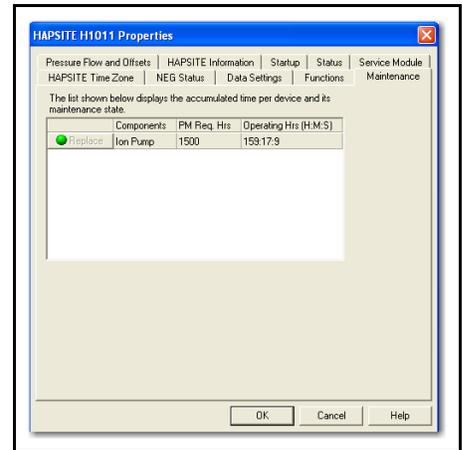
Manual Used to manually control the pumps and vents in the Service Module. See [Figure 5-11](#).

Figure 5-11 Manual control window



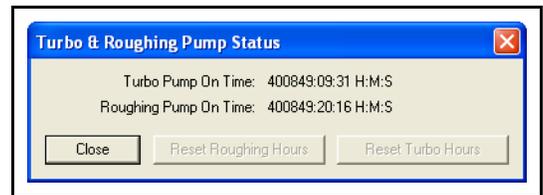
Ion Pump Status Displays Ion Pump operating hours.
See [Figure 5-12](#).

Figure 5-12 Ion pump status window



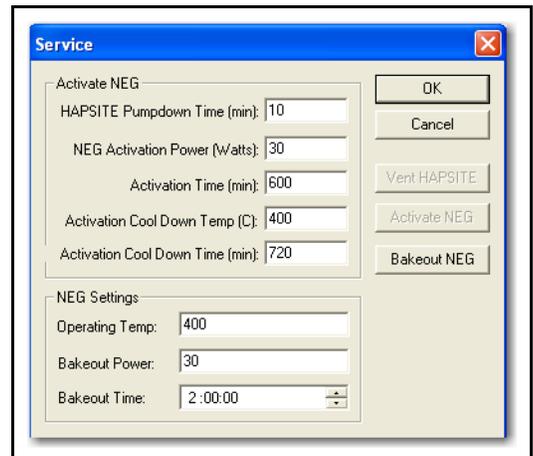
Turbo & R.P. Status Displays Turbo & Roughing Pump operating hours. See [Figure 5-13](#).

Figure 5-13 Turbo & roughing pump status window



Service For use by a trained technician for non-evaporable getter pump related issues. See [Figure 5-14](#).

Figure 5-14 Service window



The following status items are reported in the **Service Module** tab of the **Properties** Window. Refer to [Figure 5-9](#).

- Supply Volts (V)** Approximately 24 V (dc)
- Battery (V)** Approximately 24 V (dc)
- Battery Level (%)** The charge percentage of the HAPSITE battery (inserted in the battery compartment of the Service Module), as a percentage of the full capacity. Displays "No Battery" if a battery is not installed.
- Board Temp (C)** The temperature near the processor board in the Service Module in degrees Celsius.
- Turbo Speed (Hz)** The speed of the Turbo Pump in Hertz (equivalent to rotational speed in revolutions per second).
- Turbo Current (A)** The current draw of the Turbo Pump in amperes.
- Total Press (Pa)** The vacuum pressure in the Mass Spectrometer in Pascals.

5.4 Starting Up HAPSITE on the Service Module

Please refer to [section 5.2, Placing HAPSITE on the Service Module](#), on page 5-2 on how to place the HAPSITE on the Service Module prior to attaching.



CAUTION

Prior to attaching HAPSITE to the Service Module, unplug the black NEG cable inside the HAPSITE front panel. This will ensure that the NEG will not heat when using the Service Module to provide vacuum.



WARNING

Attaching or venting HAPSITE with a NEG that has not cooled will cause total NEG consumption and possibly result in severe damage to the HAPSITE Mass Spectrometer components. It may also result in physical injury since extreme heat generation from NEG consumption will create hot surfaces.



CAUTION

Damage to the Turbo Pump may result from moving the Service Module while the pump is operating.

NOTE: If the Service Module must be moved and HAPSITE is **Attached** (Turbo Pump is running), first **Detach** HAPSITE and power off the Service Module. See [section 5.6, Detaching HAPSITE](#), on page 5-16.

Power for HAPSITE is provided through the Service Module as long as the Service Module is connected to a power source and turned on. Turn on HAPSITE by pushing the **POWER** button either inside or outside the front door, depending on the HAPSITE model.

NOTE: If HAPSITE is already powered on, it does not need to be turned off before placing it on the Service Module.

5.5 Attaching HAPSITE to the Service Module



WARNING

Attaching or venting HAPSITE with a NEG that has not cooled will cause total NEG consumption and possibly result in severe damage to the HAPSITE Mass Spectrometer components. It may also result in physical injury since extreme heat generation from NEG consumption will create hot surfaces.

If the Service Module has been in storage, refer to [section 4.2.1, Setting Up the Service Module](#), on page 4-2 before continuing.

HAPSITE must be turned on before continuing (refer to [section 5.4, Starting Up HAPSITE on the Service Module](#), on page 5-9).

Physically attach HAPSITE to the Service Module (refer to [section 5.2, Placing HAPSITE on the Service Module](#), on page 5-2).

HAPSITE can be electronically attached to the Service Module using the IQ Software, or using the HAPSITE front panel. Refer to the appropriate HAPSITE model operating manual for more instruction on front panel usage.



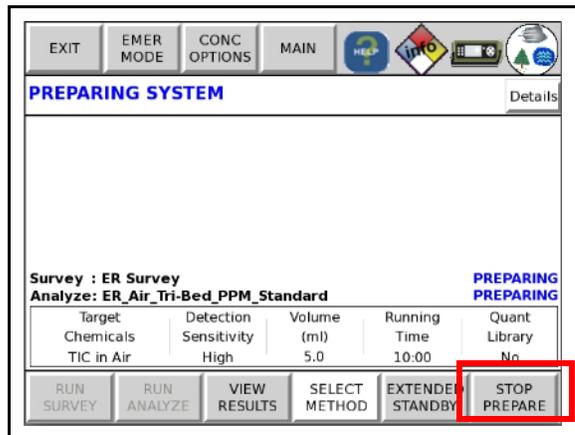
CAUTION

When operating the Service Module, the vents must be kept clear to allow free airflow. Air flows from right to left through the Service Module to allow cooling of the pumps. A blockage can prevent the air from cooling the pumps properly and may cause the over-temperature protection sensor to automatically shut down the pumps.

5.5.1 Attaching HAPSITE to the Service Module Using IQ Software

- 1 Make sure that the HAPSITE does not heat, or is in the **NOT READY** state. As soon as the HAPSITE screen is displayed, tap **STOP PREPARE** or using ◀▲▼▶, highlight **STOP PREPARE** and tap **OK SEL**. See [Figure 5-15](#).

Figure 5-15 STOP PREPARE button



CAUTION

Prior to attaching HAPSITE to the Service Module, unplug the black NEG cable inside the HAPSITE front panel. This will ensure that the NEG will not heat when using the Service Module to provide vacuum.

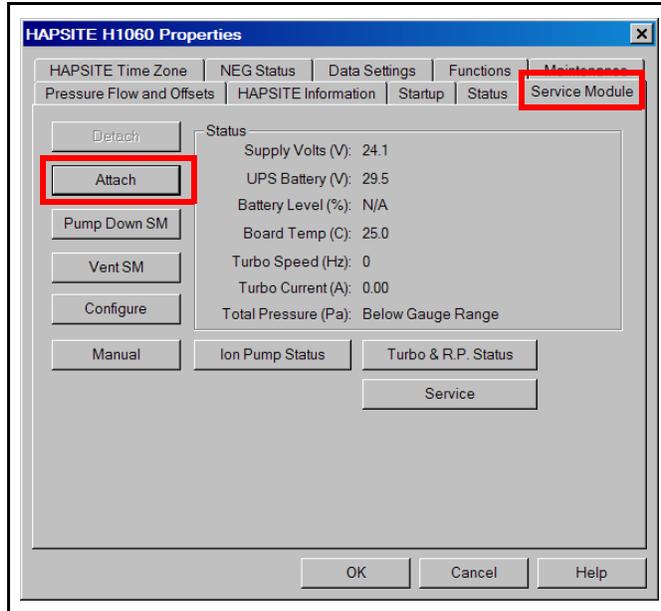
- 2 Connect HAPSITE to the computer using wireless communication or the crossover cable.
- 3 Open IQ Software.
- 4 Click the desired HAPSITE sensor icon.
- 5 Double-click the **Service Module** icon. See [Figure 5-16](#).

Figure 5-16 Service module icon



- 6 The **Service Module** tab on the **HAPSITE Properties** window displays.
- 7 Click **Attach**. See [Figure 5-17](#).

Figure 5-17 HAPSITE properties window



- 8 **Are you sure you want to attach the service module?** confirmation message is displayed. Click **Yes**. See [Figure 5-18](#).

Figure 5-18 Confirmation message



- 9 The Roughing Pump will start first, then the Turbo Pump will begin, as shown on the Turbo Speed (Hz) line in [Figure 5-17](#) above. The speed is initially displayed as 0, then increases.

NOTE: After clicking **Attach**, the **HAPSITE Properties** window can be closed.

The procedure typically takes about five minutes to complete. While attaching, the **Attaching Service Module Please Wait** message is displayed.

Figure 5-19 Attach In Process



- 10 When the procedure is finished, the **HAPSITE is Attached** message is displayed.

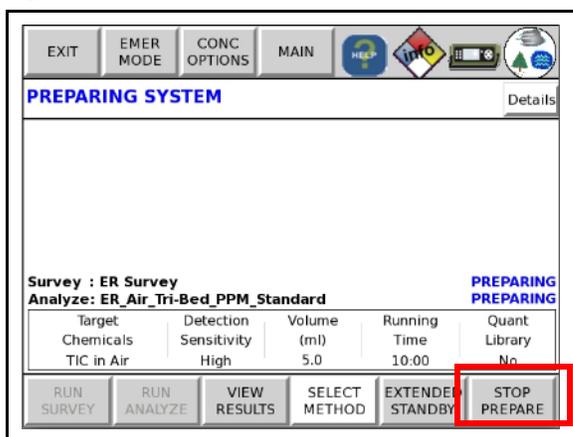
Figure 5-20 HAPSITE is Attached



5.5.2 Attaching the HAPSITE to the Service Module using the HAPSITE Front Panel Controls

- 1 To avoid running the start up method or AutoTune, tap **STOP PREPARE**. See Figure 5-21.

Figure 5-21 STOP PREPARE button



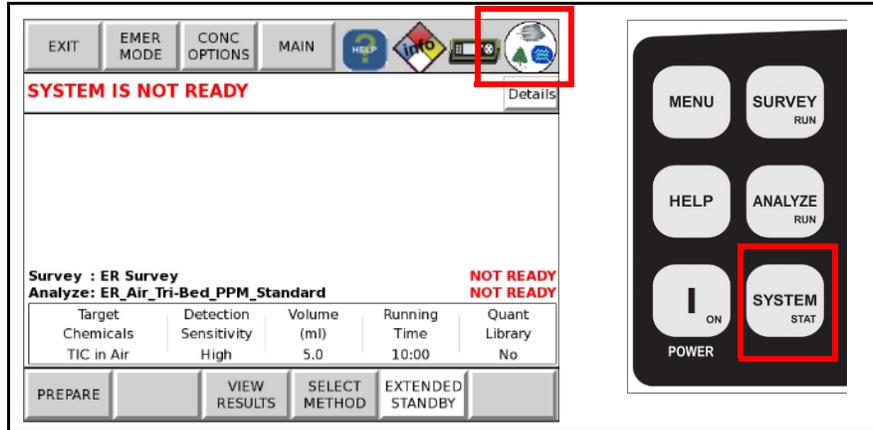
- 1a If using the push button keys, highlight **STOP PREPARE** with ◀▲▼▶. Tap **OK SEL**. See Figure 5-22

Figure 5-22 Arrow Keys



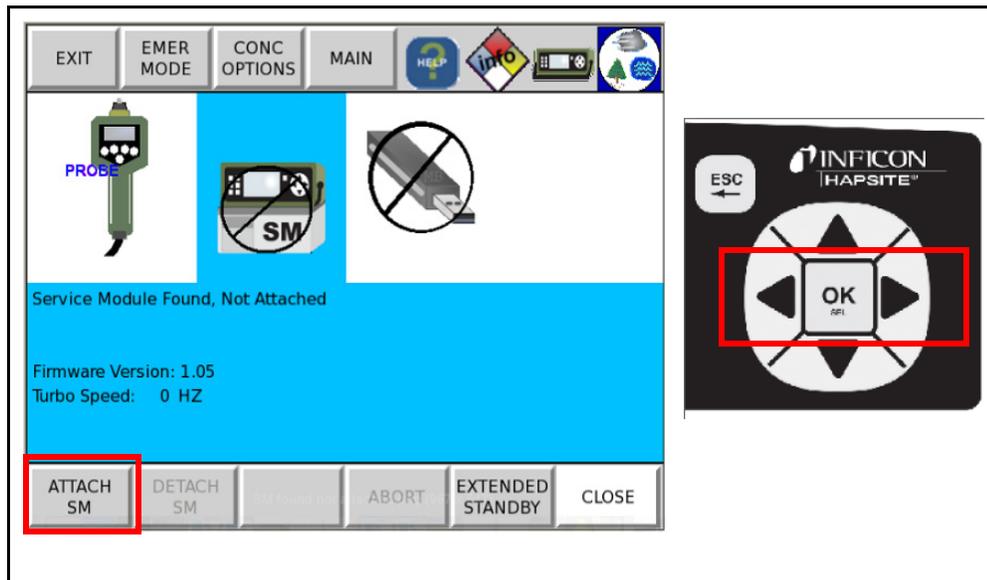
- 2 The **SYSTEM IS NOT READY** message will appear at the top of the screen.
- 3 Tap the **Accessory** icon, or push the **SYSTEM/STAT** button until the accessory page appears. See [Figure 5-23](#).

Figure 5-23 Accessory Button and SYSTEM/STAT



- 4 Tap the **ATTACH SM** button or using ◀▶▶▶ highlight the **ATTACH SM** button and tap **OK SEL**. See [Figure 5-24](#).

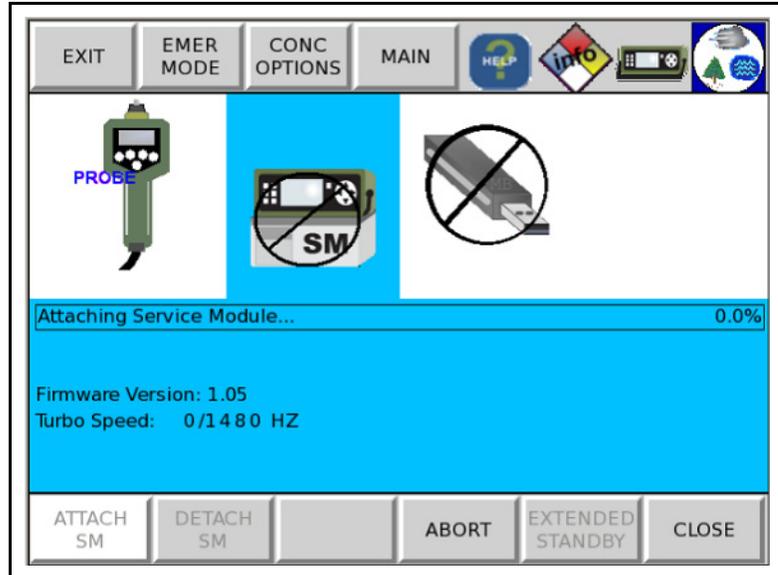
Figure 5-24 Service Model Attach Button



- 5 A status bar displaying the progress of the attach procedure will be displayed. See Figure 5-25.

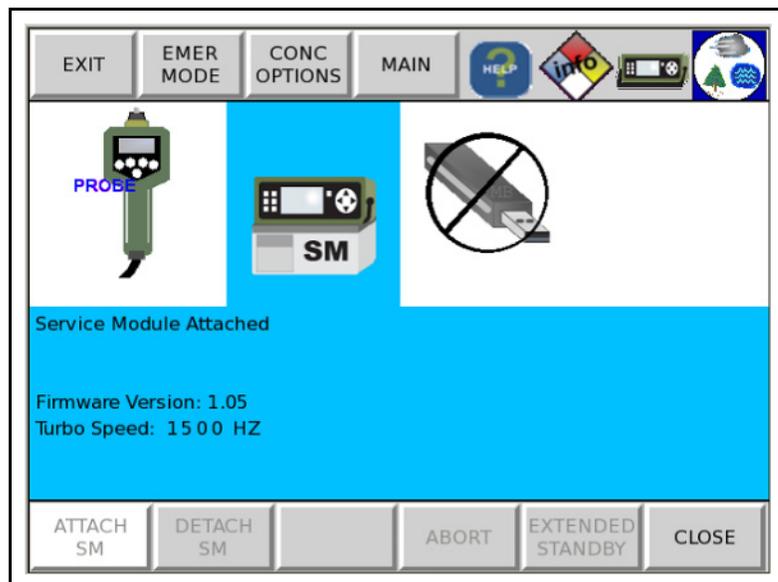
NOTE: The **ATTACH SM** button will be grayed out.

Figure 5-25 Attach progress



- 6 When the Attach has successfully completed, the **Service Module Attached** message will be displayed. See Figure 5-26.

Figure 5-26 Service Model Attached



NOTE: Both **ATTACH SM** and **DETACH SM** buttons will be grayed out immediately after a successful attach while the system prepares.

5.6 Detaching HAPSITE

The detach procedure ensures that the interconnect valve on HAPSITE is closed at the proper time, and the two pumps in the Service Module are properly shut down.

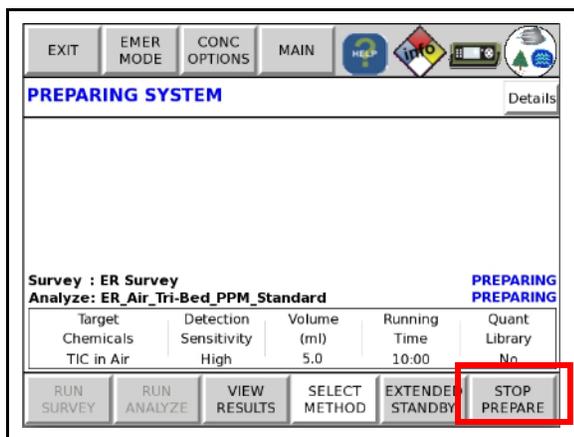
The detach procedure can be performed using IQ Software or the HAPSITE front panel display.

NOTE: Refer to the appropriate HAPSITE model operating manual for instruction on front panel usage.

5.6.1 Using IQ Software to Detach

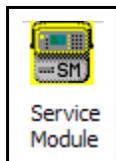
- 1 Make sure that the HAPSITE does not heat, or is in the **NOT READY** state. As soon as the HAPSITE screen is displayed, tap **STOP PREPARE** or using ◀▲▼▶, highlight **STOP PREPARE** and tap **OK SEL**. See [Figure 5-27](#).

Figure 5-27 STOP PREPARE button



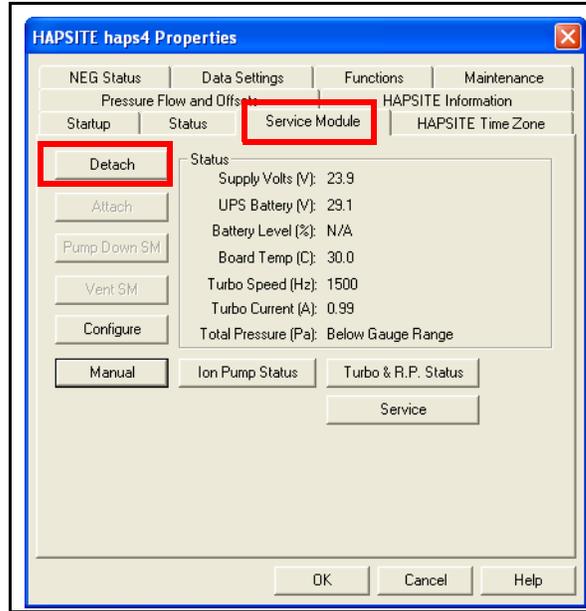
- 2 Connect HAPSITE to the computer using wireless communication or the crossover cable.
- 3 Open IQ Software.
- 4 Click the desired HAPSITE sensor icon.
- 5 Double-click the **Service Module** icon. See [Figure 5-28](#).

Figure 5-28 Service module icon



- 6 The **Service Module** tab on the **HAPSITE Properties** window displays. See [Figure 5-29](#).
- 7 Click **Detach**.

Figure 5-29 Properties window



- 8 **Are you sure you want to detach the service module?** message will display. Click **Yes**. See [Figure 5-30](#).

Figure 5-30 Are you sure detach message



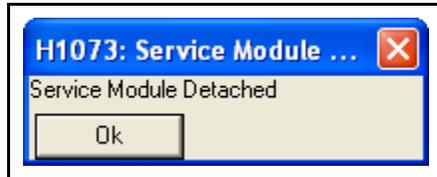
- 9 **Detaching Service Module Please Wait** message is displayed. See [Figure 5-31](#).

Figure 5-31 Detach In Process



- 10** The HAPSITE Vacuum Interconnect valve will close shortly after selecting **Detach**.
 - ◆ The detach procedure typically takes about three to five minutes to complete.
 - ◆ After clicking **Detach**, the HAPSITE **Properties** window can be closed.
- 11** When the procedure is completed, a **Service Module Detached** message is displayed. See [Figure 5-32](#).

Figure 5-32 Detach Successful

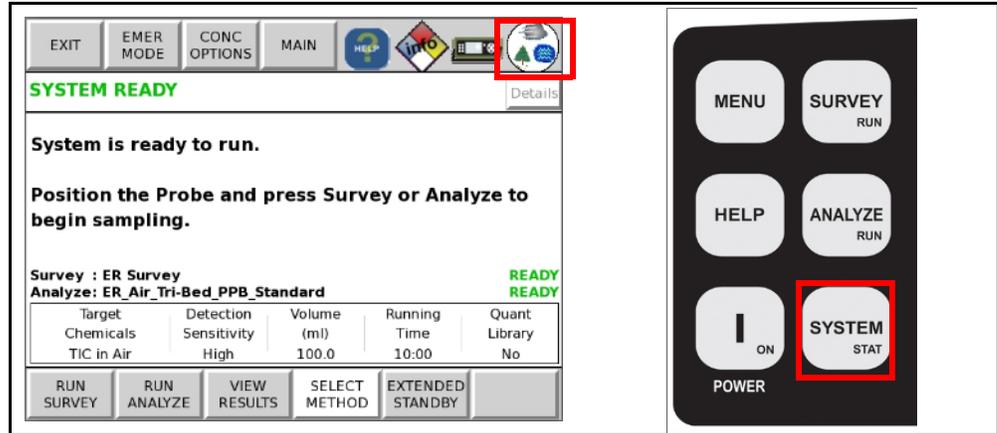


NOTE: To place the Service Module in storage see [Chapter 6, Service Module Storage and Maintenance](#).

5.6.2 Using the Front Panel Display to Detach

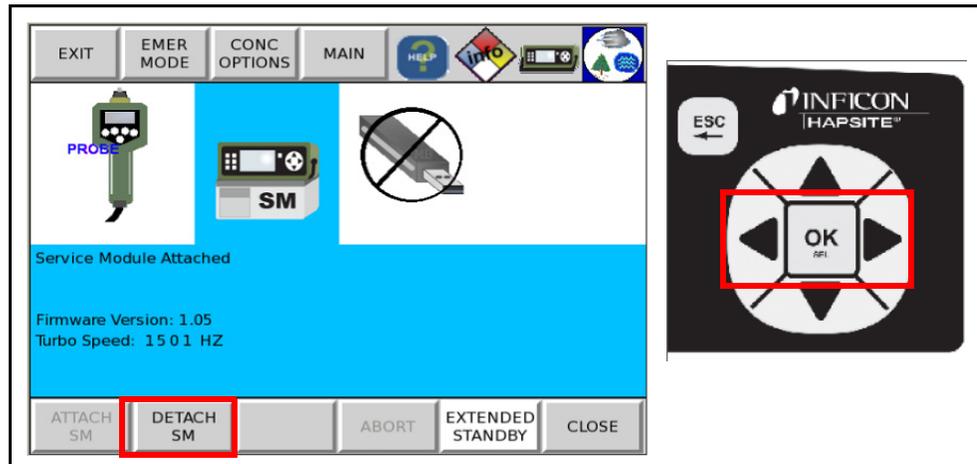
- 1 Tap the **Accessories** icon. Alternately, tap **SYSTEM/STAT** until the **Accessories** page appears. See Figure 5-33.

Figure 5-33 Accessories Icon



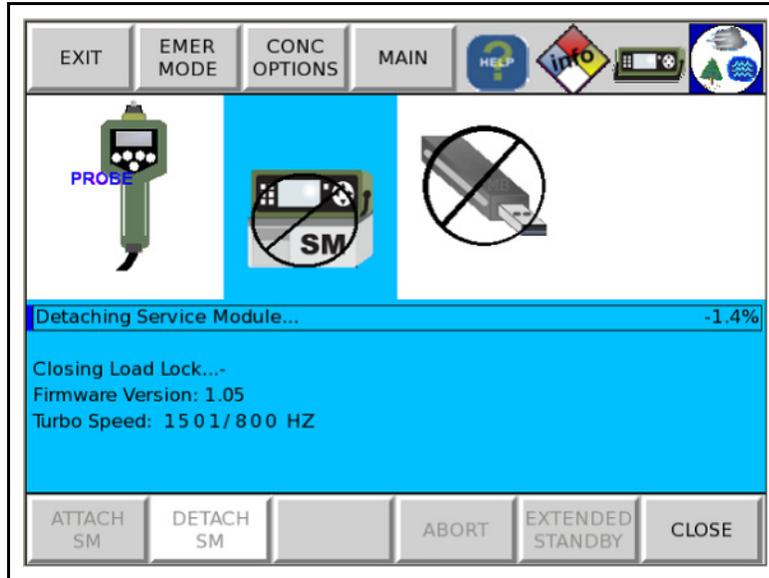
- 2 Tap the **DETACH SM** button. Alternately, using ◀ ▲ ▼ ▶ highlight the **DETACH SM** button. Tap **OK SEL**. See Figure 5-34.

Figure 5-34 Detach SM



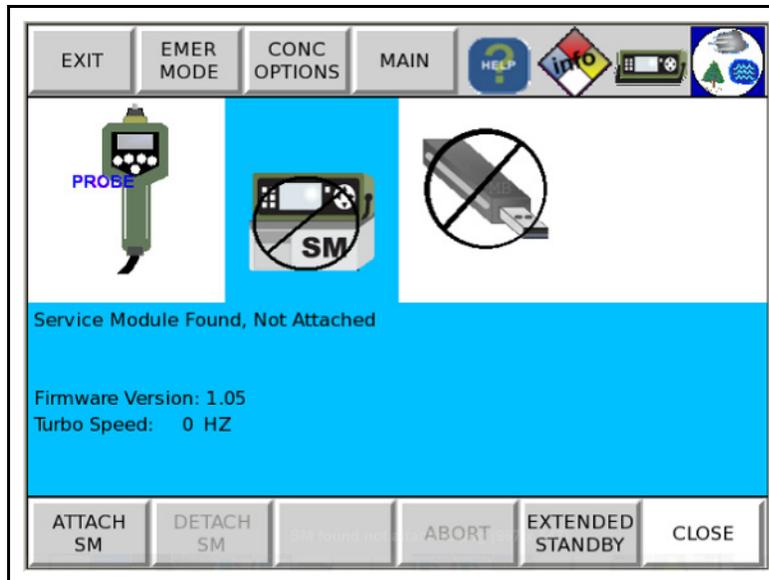
- 3 A status bar displaying the progress of the Detach procedure will appear on the front panel of HAPSITE. See [Figure 5-35](#).

Figure 5-35 Detaching the HAPSITE



- 4 When fully detached, the message **Service Module Found, Not Attached** will be displayed on the screen. See [Figure 5-36](#).

Figure 5-36 Fully Detached



CAUTION

Wait until the Turbo Speed reads zero (0 Hz) before physically removing HAPSITE from the Service Module.

5.7 Physically Removing HAPSITE from the Service Module



CAUTION

The **Detaching HAPSITE** procedure must be performed before removing HAPSITE from the Service Module. Refer to **section 5.6 on page 5-16** before continuing.

NOTE: To continue using HAPSITE, place a charged battery in HAPSITE or connect HAPSITE to external power before removing HAPSITE from the Service Module. It is not necessary to power off the HAPSITE prior to removal from the Service Module.

After performing [section 5.6, Detaching HAPSITE, on page 5-16](#):

- 1 Plug in the black NEG cable inside the HAPSITE front panel, to ensure the NEG will operate properly for portable operation. The NEG will now start to heat if the unit was already powered on.
- 2 Release the latches on each side of the Service Module.
- 3 Lift HAPSITE off the Service Module in a straight, upward direction.
- 4 Replace the plastic protective covers on the bottom of HAPSITE. See [Figure 5-37](#).

Figure 5-37 Protective cover



See [Chapter 6, Service Module Storage and Maintenance](#), for proper storage of the Service Module.

Chapter 6

Service Module Storage and Maintenance

6.1 Introduction

When not attached to HAPSITE, the Service Module must be stored with the aluminum storage cap and protective plastic cover in place.

To store the Service Module in this configuration, clean the O-ring, install the aluminum cap, perform a pump down, and install the protective cover.

Vacuum holds the aluminum storage cap in place. The cap and plastic cover protect the Service Module from dust, debris, and moisture.

NOTE: HAPSITE is considered *attached* if HAPSITE is docked on the Service Module and the Turbo Pump is running at a speed greater than 0 Hz.

If HAPSITE is *attached* to the Service Module, the Service Module must be *detached* before continuing. Refer to [section 5.6, Detaching HAPSITE](#), on page 5-16, and [section 5.7, Physically Removing HAPSITE from the Service Module](#), on page 5-21.

6.2 Cleaning the O-ring

Clean the O-ring as instructed in [section 5.1, O-ring Cleaning and Inspection](#), on page 5-1.

6.3 Installing Aluminum Cap

Place the aluminum storage cap on the opening where HAPSITE connects, as shown in [Figure 6-1](#).

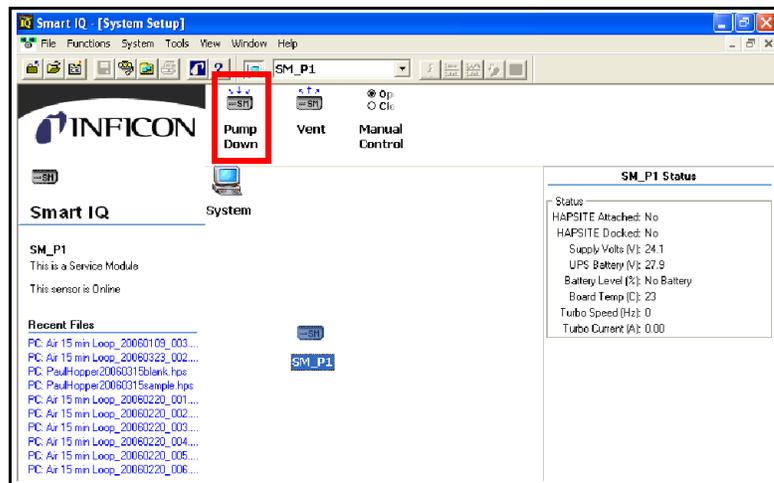
Figure 6-1 Aluminum storage plug in place



6.4 Pump Down Procedure

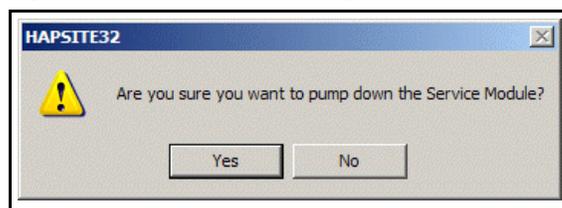
- 1 The RS-232 communication cable must be connected to the Service Module and computer. If it is not attached, refer to [section 4.2.1, Setting Up the Service Module](#), on page 4-2 before continuing.
- 2 Open IQ Software.
- 3 Double-click the **Pump Down** icon to start the pump down process. See [Figure 6-2](#).

Figure 6-2 Pump Down icon



- 4 **Are you sure you want to pump down the Service Module?** message is displayed. See [Figure 6-3](#).
- 5 Click **Yes**.

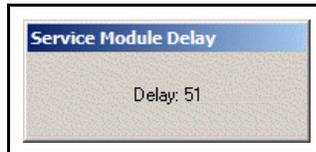
Figure 6-3 Confirmation message



- 6 A window displays a sixty second count down (delay). Wait for the delay to reach 0. See [Figure 6-4](#).

NOTE: The Roughing Pump will operate for sixty seconds to create a partial vacuum, sealing the aluminum storage cap in place.

Figure 6-4 Count down



- 7 After the delay has completed, place the plastic protective cover on top of the aluminum storage cap. See [Figure 6-5](#).

Figure 6-5 Protective cover placed over aluminum storage plug



- 8 Turn off the Service Module power switch, located at the back right corner of the Service Module. Refer to [Figure 4-4 on page 4-3](#).
- 9 Store the Service Module in a clean, dry location.



CAUTION

The Service Module should be stored in a clean and dry area. Avoid storing the Service Module in areas of high humidity or areas which are outside the temperature range of 40 to 95°F (5 to 35°C).

6.5 Routine Maintenance

After approximately 4000 hours of use, the Service Module will need Preventative Maintenance on both the Turbo and Roughing Pump. The Turbo Pump contains a series of fan blades which are supported by a series of bearings. The bearings are lubricated with an oil wick that will need to be replaced as part of routine maintenance.

The Roughing Pump oscillates four diaphragm pumps which move the exhaust from the Turbo Pump to the exhaust vent. The diaphragms, valve seals and valve disks will need to be replaced as part of routine maintenance.



CAUTION

Routine maintenance procedures must be performed by factory trained personnel. Contact INFICON for assistance.

To view the usage hours of the Service Module:

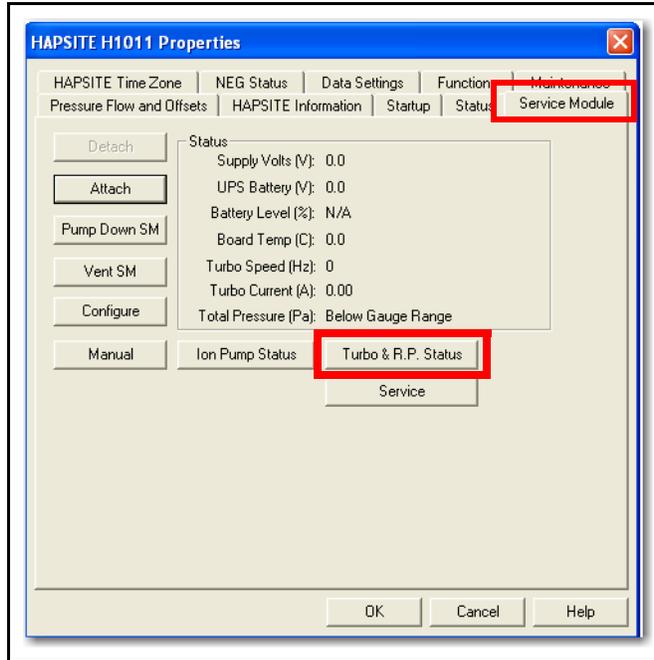
- 1 In IQ Software, click on the desired HAPSITE sensor, then double-click the **Service Module** icon. See [Figure 6-6](#).

Figure 6-6 Service Module Icon



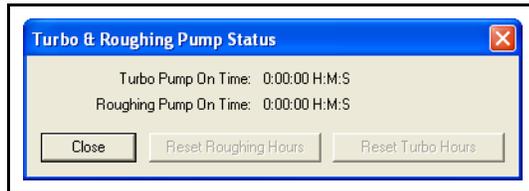
- 2 Select the **Service Module** tab on the **HAPSITE Properties** window. Click **Turbo and R.P. Status**. See [Figure 6-7](#).

Figure 6-7 HAPSITE Properties- Service Module Tab



- 3 [Figure 6-8](#) shows the Turbo & Roughing Pump Status display. 0:00:00 indicates that the pumps are not currently running.

Figure 6-8 Turbo and R.P. Status



6.5.1 Replacing the O-ring

- 1 Carefully pry the damaged O-ring from the Interconnect Valve on the Service Module.
- 2 Clean the area under the removed O-ring using methanol and lint-free wipes. Inspect the new O-ring (PN 070-946 included in Gasket Kit PN 930-021-G1) for any cracks or damage. Insert the new O-ring into the groove and gently stretch the new O-ring into place. Clean the new O-ring using methanol and lint-free wipes.

