

# EL-53200

## BATTERY ENCLOSURE SEAL PRESSURE TESTER

### USER GUIDE



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## Overview

The EL-53200 Battery Enclosure Seal Pressure Tester (BESPT) is used for low pressure leak testing on battery electric vehicle (BEV) battery packs for leaks as small as 10 SCCM. It is designed to perform leak tests at low pressure (-0.5 psi) to prevent damage to the battery compartment and the associated seams/seals.

The tool utilizes an internal pump that supplies low pressure or vacuum without external sources. The BESPT is powered by an external 12VDC 4A power supply that connects via a 2.1mm plug. Pressure and Vacuum ports on the side of the BESPT mate to a 6-Ft. hookup hose through quick connects that also mate to battery pack specific adapters. The BESPT is operated through a dedicated PC application using the USB cable.

### **⚠ Warnings and Precautions**

- Leak testing of battery packs is only to be performed when indicated by diagnostic procedures. Consult GM vehicle service procedures for specific applications.
- The battery pack must be fully disconnected from the vehicle prior to leak testing.
- Battery pack safety interlock systems must not be modified or disabled.
- Only approved adapters are allowed for sealing off electrical connector housings and vent covers. Consult GM vehicle service procedures for specific applications.

## Kit Components



1 EL-53200-TESTER BESPT Main unit



2 EL-53200-HOSE 6 ft. Hookup hose

3 EL-53200-SMOKE SUPPLY  
Smoke air supply adapter



4 EL-53200-SMOKE HOSE  
Smoke hose adapter

5 EL-53200-BLOCKING  
Vent cover blocking  
adapter



6 EL-53200-HOOKUP  
Vent cover hookup adapter



7 EL-53200-USB 10 ft. USB cable



8 EL-53200-POWER  
Power supply (12v 4A)



## Kit Components and Descriptions

### 1 **Battery Enclosure Seal Pressure Tester (BESPT) (EL-53200-TESTER)**

The main test unit contains all pressure/vacuum control hardware and firmware for testing. The tester has interfaces for connecting the Hoses, Power Supply, and USB cable to vehicle components and computer (not provided). Setup and use of these will be fully described in subsequent sections.

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### 2 **6-FT. Hookup Hose (EL-53200-HOSE)**

The 6-Ft. Hookup Hose allows BESPT to evacuate the battery pack or to provide pressure for smoke generator diagnostics. The hose has female quick connects at both ends.

### 3 **Smoke Air Supply Adapter (EL-53200-SMOKE SUPPLY)**

Allows the tester to act as the low pressure air supply for a smoke generator. It adapts a standard shop-air female quick connect to the main quick connect fitting. The pair of adapters (3 and 4) are used for low pressure smoke injection and pinpointing of confirmed battery leaks.

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### 4 **Smoke Hose Adapter (EL-53200-SMOKE HOSE)**

Allows a smoke generator machine to interface with the Vent Cover Hookup Adapter for injecting smoke into the battery compartment under controlled low pressure for leak pinpointing.

### 5 **Vent Cover Hookup Adapter (EL-53200-HOOKUP)**

Replaces a pressure relief vent on the battery pack and provides an access port for leak testing. It has a male quick connect for attaching the Hookup Hose that also mates to the tester vacuum test port. It is installed via self-contained cap nuts. Used in conjunction with special adapter kits (see service procedures) to block off and seal all electrical connectors on the battery pack prior to leak testing.

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### 6 **Vent Cover Blocking Adapter (EL-53200-BLOCKING)**

Replaces a second pressure relief vent used on some battery packs prior to leak testing. Installed via self-contained cap nuts. Used in conjunction with special adapter kits (see service procedures) to block all electrical connectors on the battery pack prior to leak testing.

### 7 **10-FT. USB Cable (EL-53200-USB)**

The 10-Ft USB cable connects the main unit to the computer with the interface PC app installed. It has a male USB micro plug on one end and USB male type A plug on the other end.

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### 8 **12V Power Supply (EL-53200-POWER)**

Provides regulated 12 VDC 4A power to the BESPT via the power cord and 2.1mm plug. The power supply plugs into a standard 110 VAC wall outlet.



## PC Requirements and Application Installation

- Windows 10 64-bit PC
- i3 Processor or above
- 1 Gb free hard drive space
- 2 Gb or more ram
- 1 free USB Port (2.0 or higher)
- Screen resolution 720p or higher

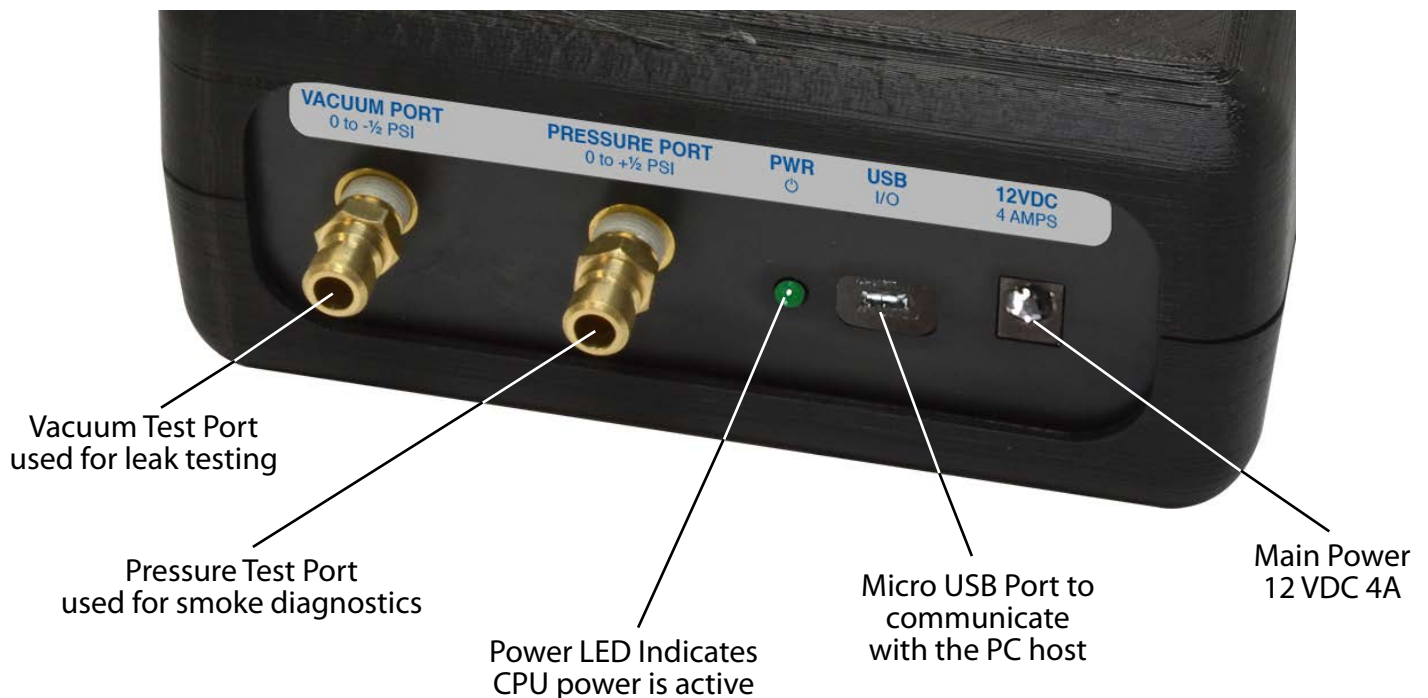
The BESPT PC application is found at [gmtoolsandequipment.com](http://gmtoolsandequipment.com) as a self-extracting executable. The application can be saved and installed from any download folder. The target PC requires administrative rights to install or update this application (Contact your IT Administrator if installation issues occur). Double click the file and follow the on screen program installation instructions. It is recommended that you check the box to create a desktop icon.

After the PC application is installed, setup may request permission to update the tester assembly firmware. To perform a firmware update the tester must be connected to the host PC using the 10ft. USB cable (EL-53200-USB). **(Note: The 12V power supply is not required to perform firmware updates.)** After the unit is connected, click the Begin Update button to proceed. After the firmware update has been installed the window will close automatically and setup will finish.

For future updates to the PC application, it is not necessary to uninstall the current version. The setup installer handles this and the desktop icon will continue to launch the latest version of BESPT software.

### Leak Testing Hookup

#### BESPT end plate interface





## PC Requirements and Application Installation

### Vent Cover Adapters Installation Procedure (EL-53200-HOOKUP & EL-53200-BLOCKING)

The battery pack must be located in a secure horizontal orientation and stabilized at room temperature for at least one hour prior to test preparation.

Seal off all connector housings and vents per the approved service procedures.

Remove battery vent covers from the locations where the Vent Cover Adapters are to be installed (see example in Fig. 1).

Make sure the surfaces around and under the vent mounting location are clean of debris (see Fig. 3).

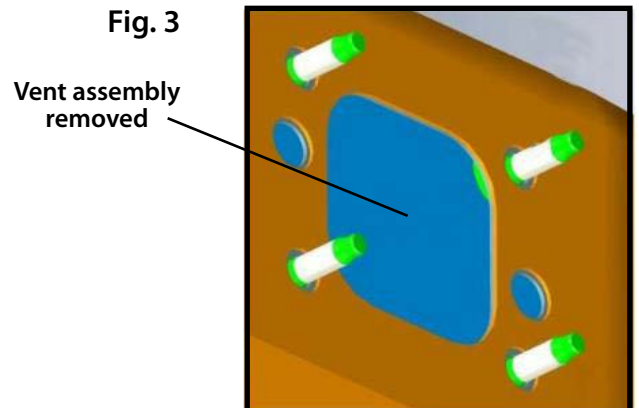
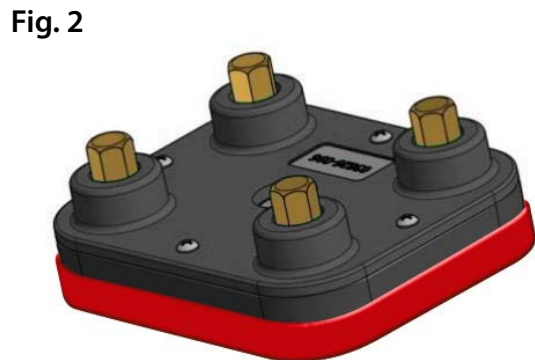
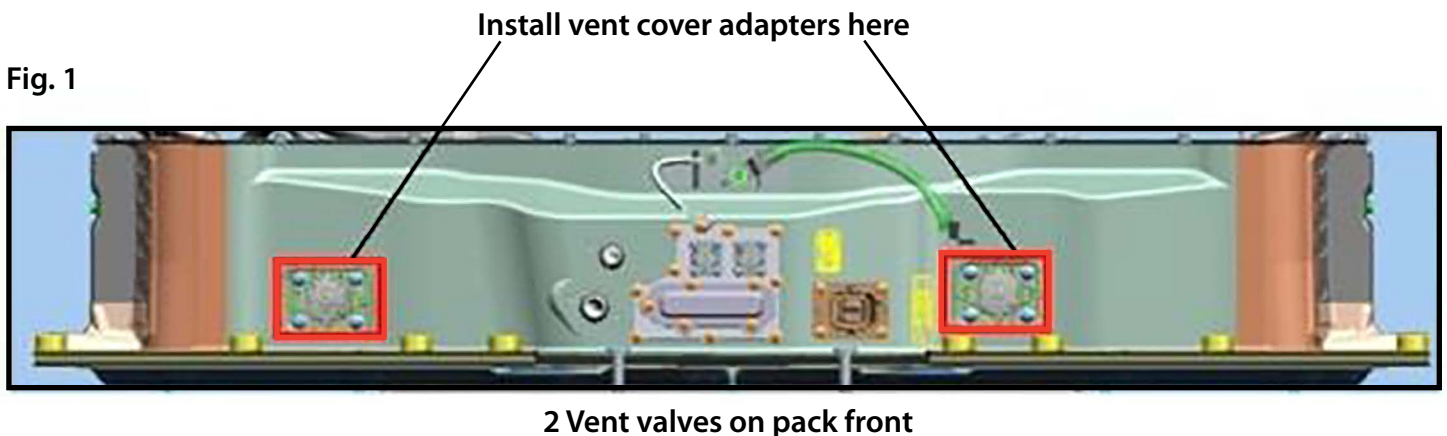
Push down the Vent Cover Hookup Adapter (EL-53200-HOOKUP), with the rubber gasket down, over the studs and continue pushing down evenly until it fully seats (see Fig. 2).

By hand, start all four hex cap nuts. Fully hand tighten evenly in sequence.

Once complete, use a wrench and tighten each cap nut one full turn (360 Degrees)

**Note: No more than 1.5Nm (13.3 lb in) should be applied or damage to the Vent Cover Adapter(s) may occur.**

Duplicate this procedure when both vent covers are required.





# **Connecting BESPT for Testing**

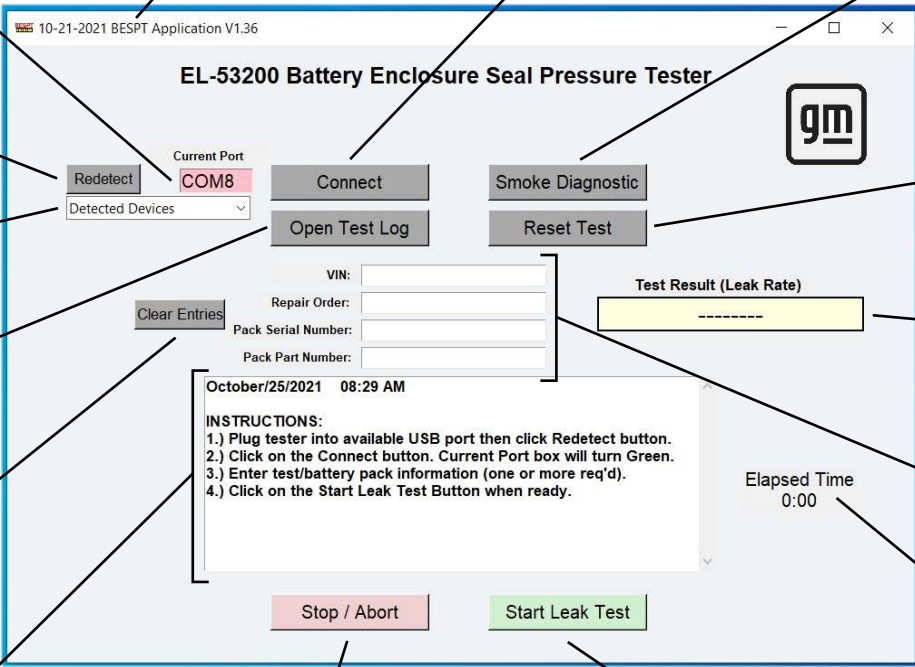
Connect the Hookup Hose (EL-53200-HOSE) quick connects to the Vent Cover Hookup Adapter and the Vacuum Port on BESPT.

Connect the Power Supply (EL-53200-POWER) to the BESPT.

Connect the USB (EL-53200-USB) cable to the BESPT USB port and then to an open USB port on the host PC.

Verify that the green PWR LED on the BESPT is on.

## PC application controls and Information display



**Legend:**  
 Red: Port Detected  
 Yellow: Port not found  
 Green: Port Connected

**Callouts and Annotations:**

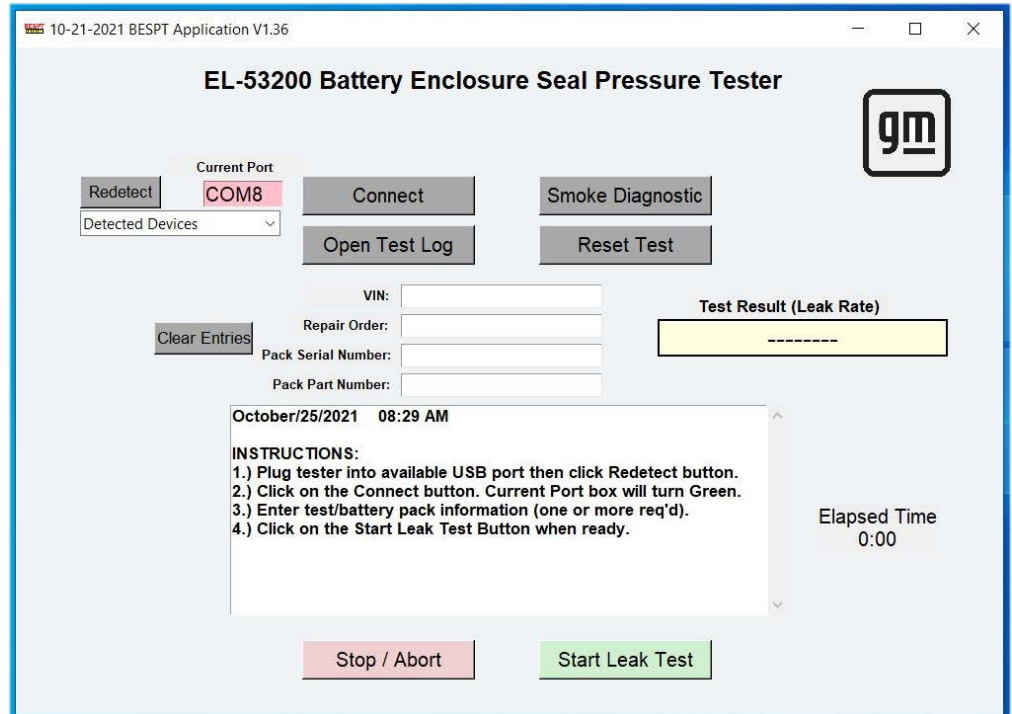
- Redetect:** Redetects recognized devices
- Current Port (COM8):** Manually select COM port
- Connect:** Connect/Disconnect the current port
- Smoke Diagnostic:** Starts ½ PSI air pressure supply for Smoke Diagnostics
- Reset Test:** Resets all data for a new test
- Test Result (Leak Rate):** Leak Rate
- Elapsed Time (0:00):** Elapsed time of current test
- Start Leak Test:** Starts vacuum leak test (Fully automated)
- Stop / Abort:** Stop or Abort any test
- Clear Entries:** Clears battery information
- Open Test Log:** Detailed history of performed tests
- Text Window:** Text window displays instructions, real time status, and test results
- Vehicle and Battery pack data entry:** VIN, Repair Order, Pack Serial Number, Pack Part Number

**Application Text:**  
 10-21-2021 BESPT Application V1.36  
**EL-53200 Battery Enclosure Seal Pressure Tester**  
 gm logo  
 VIN: \_\_\_\_\_  
 Repair Order: \_\_\_\_\_  
 Pack Serial Number: \_\_\_\_\_  
 Pack Part Number: \_\_\_\_\_  
 October/25/2021 08:29 AM  
**INSTRUCTIONS:**  
 1.) Plug tester into available USB port then click Redetect button.  
 2.) Click on the Connect button. Current Port box will turn Green.  
 3.) Enter test/battery pack information (one or more req'd).  
 4.) Click on the Start Leak Test Button when ready.

## Connecting BESPT for Testing

Application should be blank when opened. Com8 will be "RED" until connected.

Press the connect button to connect to BESPT to USB port.

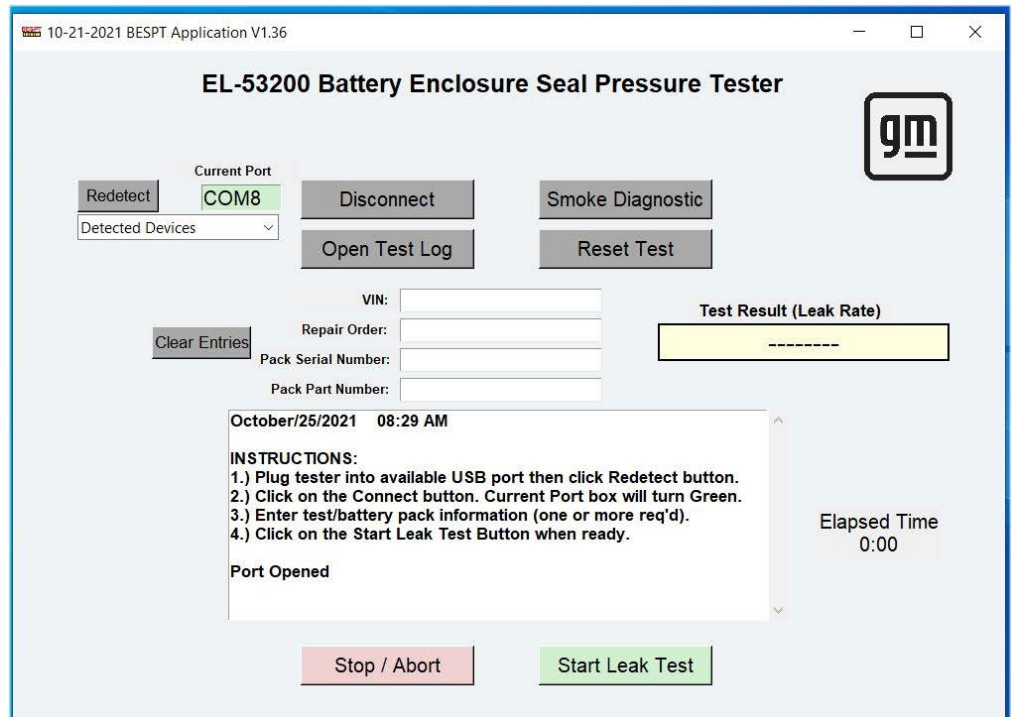


COM8 is now connected as referenced in "Current Port" field (green).

Enter VIN, Repair Order, Pack Serial Number and Pack Part Number.

Select "Start Leak Test". BESPT will Pull Vacuum, stabilize the pressure and monitor decay. Ensure the battery pack is not worked on or moved during the test.

**Note: Placing objects on the pack cover will change the internal air volume and provide a false test result.**






# Test Results (Leak Rate Display)

10-21-2021 BESPT Application V1.36

## EL-53200 Battery Enclosure Seal Pressure Tester



Current Port: **COM8**

Buttons: Redetect, Disconnect, Smoke Diagnostic, Open Test Log, Reset Test

Detected Devices: [Dropdown]

Clear Entries

VIN: VZ56UIL9231AY

Repair Order: RO490485

Pack Serial Number: JJ25-FE-1209384

Pack Part Number: 347060-7847373

**Test Result (Leak Rate)**  
**12.34 sccm**

Stabilization Complete. Waiting to reach test pressure.  
Step 3 of 4: Calibration in Progress.  
Calibration Complete.  
Step 4 of 4: Measurement in progress.  
Measurement Complete.  
Leak Testing Has Completed.  
Elapsed Time = 5.18 Minutes.  
Tank Fill = 4.52  
Test Type = 1  
Result = 12.34 sccm

Elapsed Time: 5.18

Buttons: Stop / Abort, Start Leak Test

**After Leak Test is completed. See Test Result: (Leak Rate).**



## Smoke Diagnostics (For Failed leak test)

### Smoke Diagnostic Procedure:

Start the BESPT Smoke Diagnostics by clicking on the "Smoke Diagnostics" button on the PC application.

Enable the smoke generator flow.

Temporarily disconnect the Smoke Hose Adapter from the Vent CoverAdapter.

Wait until thick smoke is coming out of the hose then re-connect the Smoke Hose Adapter to the Vent Cover Hookup Adapter.

Remove the tape over one of the pressure relief vent ports on the HV Battery Pack Enclosure. Allow smoke to fill battery and exit from the pack enclosure. Reseal the pressure relief vent port with the tape.

The BESPT will pressurize the battery pack with smoke to no more than ½ PSI and hold pressure. Allow 1-2 minutes for the smoke to saturate the battery compartment.

Using a bright light, Examine the battery pack cover seam and around all electrical connectors.

**Note: air movement in the repair area may disperse leaking smoke and complicate locating a leak.**

The BESPT smoke air supply function will automatically shut off after 8 minutes.

If a leak has been identified and repaired, retest with BESPT to verify the repair.



## Smoke Diagnostics (For Failed leak test)

For pinpointing the location of leaks identified by BESPT use the Smoke Hose & Smoke Supply Adapters with the appropriate smoke machine as referenced in the service procedures.

Connect the Hookup Hose Adapter (EL-53200-HOSE) to the Pressure Test Port on the BESPT unit.

Connect the other end of the Hookup Hose Adapter to the Smoke Supply adapter (EL-53200-SMOKE SUPPLY).

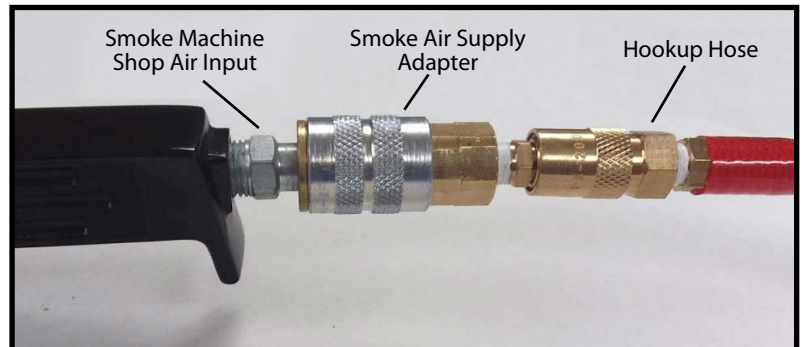
Attach the female Smoke Supply Adapter to the smoke machine shop air male quick connect (see Fig. 4).

The Vent Cover Hookup Adapter should already be installed on the battery pack.

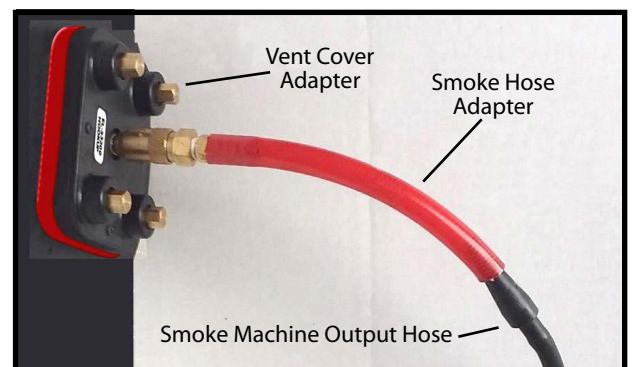
Connect the Smoke Hose Adapter (EL-53200-SMOKE HOSE) to the end of the smoke generator hose using the rubber cone adapter (See Fig. 5).

Plug the quick connect side of the Smoke Hose Adapter to the Hookup Vent Cover Adapter.

**Fig. 4 Smoke Machine supply hookup to BESPT**



**Fig. 5 Smoke Machine output hose hookup the Vent Cover Adapter**



**Battery Enclosure Seal Pressure Tester**

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