

OPERATOR MANUAL

Vehicle Evaporative Emissions Leak Detection System

Diagnostic Smoke[®] Vapor Machine
with Nitrogen Generator and UltraTraceUV[®] Dye Solution

Part No. 625-522B-BMW

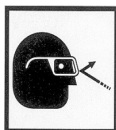


Approved for Flex-Fuel Vehicle Testing



Cautions & Usage Tips:

TO PREVENT PERSONAL INJURY AND / OR DAMAGE TO VEHICLE OR EQUIPMENT



- **DISCONNECT** the smoke machine from the vehicle prior to starting the engine or prior to running any on-board monitor, including the DMTL or LDP. Damage caused by not following proper operating procedures will not be covered by the vehicle warranty or the smoke machine warranty.
- This Tester automatically produces nitrogen, when connected to shop air, in order to insure safer testing of the vehicle's fuel vapor (EVAP) recovery system. You should never introduce air, containing oxygen, into a vehicle's EVAP system!
- Be sure air source to Tester is clean and dry by using appropriate filter on your air line prior to the Tester. Dirty, oily, or wet air can damage the Tester's built-in nitrogen generator and void the warranty.
- Check / replace Tester's filters regularly (see Yearly Maintenance procedure, on page 14 of this manual).
- Use only UltraTraceUV® Smoke Solution Part No. P0716UV. Altering the solution, hoses, cables or any other replacement part will void the warranty; may cause Tester malfunction; may cause damage to vehicle, property, or may cause personal injury.
- Do not operate Tester with dipstick removed.
- Do not perform test near source of spark or ignition.
- Wear eye protection that meets OSHA standards.
- Follow safety precautions when using ultraviolet light source.
- Air pressure source to Tester must be between 90-150 PSI (6.2 to 10.3 bar).



- Use the halogen spotlight supplied to highlight the smoke exiting leaks.
- Use UV lamp supplied to look for the fluorescent deposit at the exact location of the leak(s). If using alternate UV light, be sure it is in the nanometer (nm) range of 365 or 400 \pm 5 nm.
- Smoke exiting a very small leak is even easier to see if after filling the system with smoke you cycle the remote starter button on/off at about 30-second intervals. This will introduce the smoke and allow the system pressure to decrease making the leak even more visible.
- When operating the Tester in near freezing temperatures, cycle the operation of the Tester 30 seconds ON and 30 seconds OFF for approximately the first minute or two of operation. This will allow the Tester to reach its optimum operating temperature.
- When testing an engine's intake or exhaust system for leaks, it is recommended that the engine be cold. Small leaks may be sealed due to thermal expansion.

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Specifications:

Vacutec® 625-522B-BMW -- Technical Specifications			
Height	39 in. (99 cm)	Inlet pressure required	90--150 PSI (6.2—10.3 bar)
Depth	27 in. (68.6 cm)	Supply pressure output	13.0 in. H ₂ O (0.032 bar)
Width	20 in. (50.8. cm)	Supply volume	12 liters per minute
Weight	100 lb. (45.4 kg)	Smoke supply line	12 feet (3.6 m)
Shipping wt	105 lb. (47.6 kg)	Power supply line	10 feet (3 m)
Power supply	120 volts AC 60 Hz	Remote starter cable	10 feet (3 m)
Consumption	15 amps.	Operating temp. range	45°F to 140°F (7.2°C to 60°C)
		Altitude	Up to 2,000 M (6,561 Ft)

Notes:

Vacutec® Smoke Machine EVAP Emissions System Tester with built-in Nitrogen Generator:

The Vacutec® 625-522B-BMW Smoke Machine is approved for Evaporative Emissions System (EVAP) leak-testing, as well as other systems, on all BMW vehicles.

Utilizing the most advanced patented technology, the VACUTEC® 625-522B-BMW is the most comprehensive, yet simple to operate (EVAP) tester available today. Simply connect the VACUTEC® 625-522B-BMW to compressed air (shop air) and the machine automatically converts the air to high-purity nitrogen using Pressure Swing Absorption (PSA) nitrogen technology.

This Tester performs functions that both ***quantifies*** (Phase-one) the leaks and ***identifies*** (Phase-two) the leaks. It *quantifies* the leaks by using a pass/fail flow-test that verifies 0.040" (1.0 mm) and 0.020" (0.5 mm) size EVAP leaks (capable of verifying smaller leaks and is updatable should future leak standards change). The 625-522B-BMW also verifies a leak is present by using vacuum-decay and pressure-decay tests. *Identifying* the leaks is simple. Introduce the special non-toxic Diagnostic Smoke® vapor into the system to be tested and then simply look for the exiting smoke or the fluorescent dye deposited at the exact location of the leak(s). Also finds leaks in induction systems, under-dash vacuum systems, exhaust and EGR systems, throttle bodies, unfiltered and unmetered air systems, wind and water leaks and much more. All tests are performed with the engine OFF (not running).











Please note: It is essential that you maintain a proper filtration system for the compressed air being supplied to the 625-522B-BMW Tester. Excessive moisture or oil in the air supplied to the Tester can contaminate its PSA nitrogen generators, damaging the Tester and voiding the warranty. Proper filtration will insure many years of trouble-free operation.

NOTE: If your compressed air system operates using an automatic air line oiler; it must be removed from the air supply feeding the 625-522B-BMW.

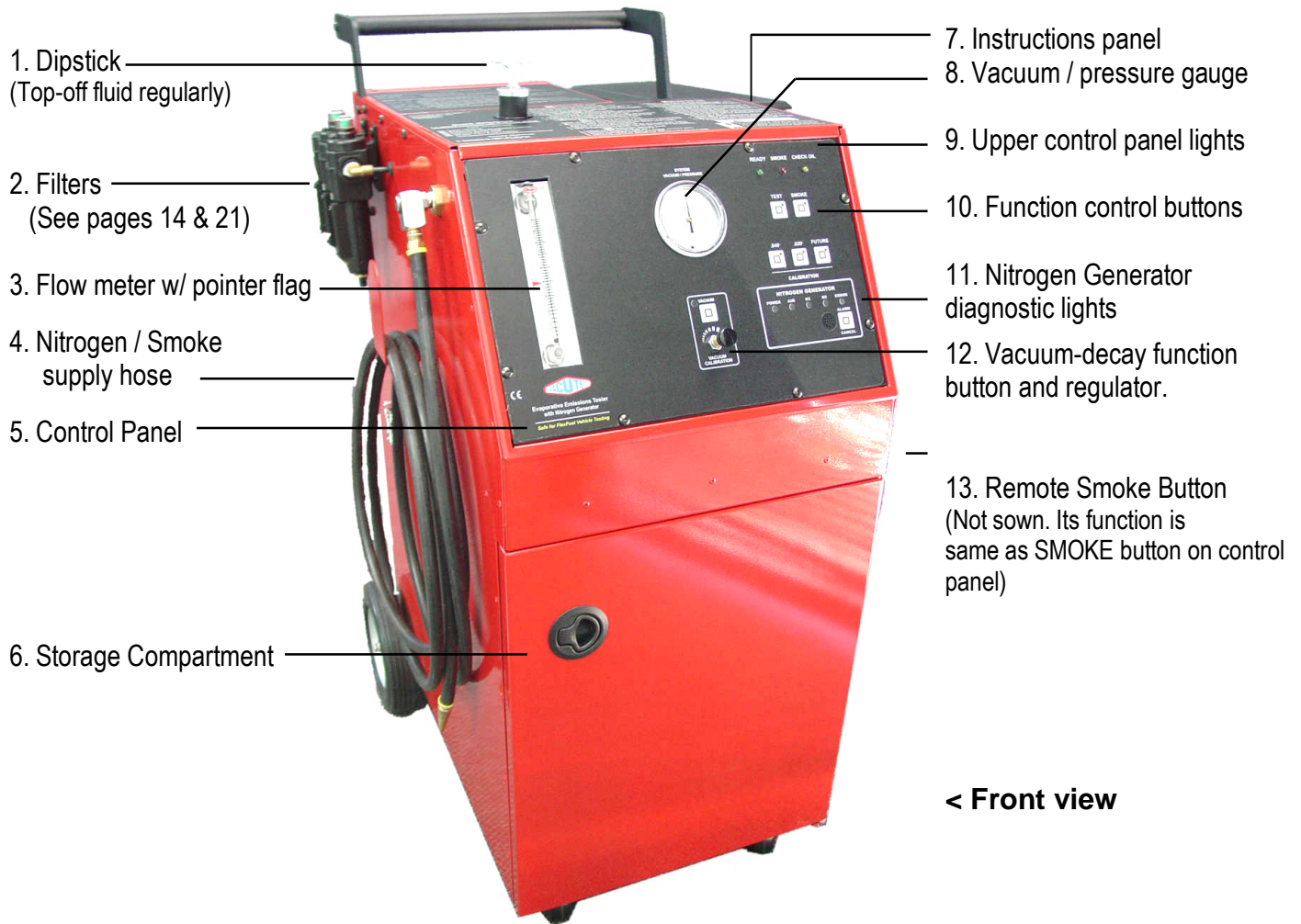


DISCONNECT the smoke machine from the vehicle prior to starting the engine or prior to running any on-board monitor, including the DMTL or LDP. Damage caused by not following proper operating procedures will not be covered by the vehicle warranty or the smoke machine warranty.

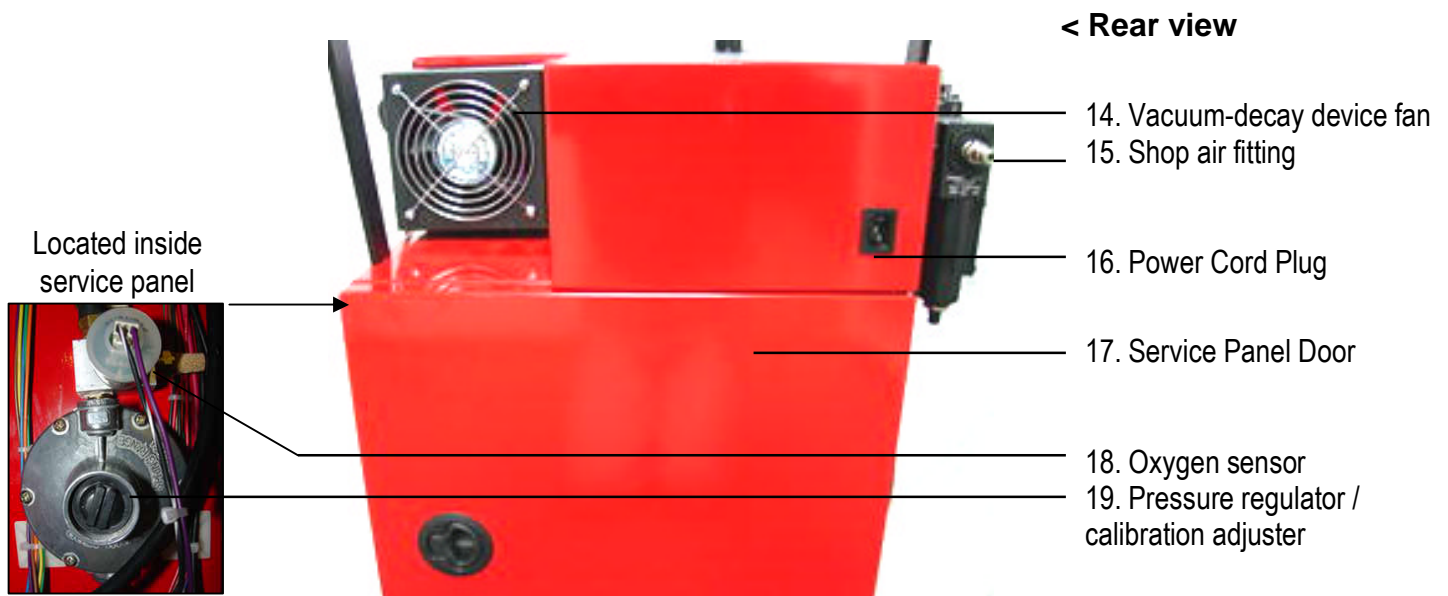
Accessories Included with Tester:

	<p>No. WVA-01 – Adapter Cone (Two included with Tester) used to either introduce smoke into the exhaust system; into any system that fits the cone's tapered size; use one as an exhaust plug when testing a dual exhaust system; or exhaust plug when testing the intake vacuum system.</p>
	<p>No. WVA-02 – Cap Plug Kit is used to seal the intake ducting of the engine being tested. They may be used to seal either the inside diameter of an opening, or flip them over and seal the opening at the outside diameter.</p>
	<p>Assortment of tapered plugs (see sizes and part numbers in Accessories and Replacement Parts List in back of manual)</p>
	<p>No. WVA-03 – Smoke Diffuser allows the operator to lay down a thick path of smoke along doors, sunroof, windshield and window seams so any air disturbance, caused by exiting internal cabin pressure, may be observed.</p>
	<p>No. HS400AC – 400 CP Halogen Spotlight highlights the smoke when searching for leaks.</p>
	<p>No. WVA16345 – Twelve LED hi-intensity true UV light. Includes battery charger and UV enhancing glasses.</p>
	<p>No. P0716UV – UltraTraceUV® Smoke Solution Tester arrives with a full charge of solution plus an additional spare bottle, for a total of hundreds of tests. Use tester's dipstick and top off smoke solution regularly.</p>
	<p>No. WVA0400-3115 – Vacuum / Pressure Fitting</p>

Tester Overview:



< Front view



< Rear view

Tester Overview – Feature Description:

1. **Dipstick:** Similar to maintaining proper oil level in a vehicle's engine, you should maintain the Tester's smoke solution level at the FULL mark.
2. **Filters:** This Tester has four filters; three outside of the cabinet and one accessed through the cabinet's rear door. Replace the three outside filter elements yearly or sooner if required. Note: See page 14 for filter replacement instructions and page 21 for filter part numbers.
3. **Flow meter w/ pointer flag:** Use to establish a quick Pass / Fail mark when determining if the EVAP system in the vehicle being tested has a .020" (0.5 mm) or .040" (1.0 mm) leak. You can also use the meter to verify flow in a system that has solenoids or a venting device that opens and closes, or simply to verify the integrity of any low pressure system for leaks.
> This flow meter is capable of detecting leaks as small as .005" (0.127 mm).
4. **Nitrogen / Smoke supply hose:** Use to deliver nitrogen, nitrogen with smoke vapor or to perform decay tests.
5. **Control Panel:** Houses all the Tester's controls.
6. **Storage Compartment:** Use to store accessories supplied with Tester.
7. **Instructions panel:** Use as quick reference of Tester's operations.
8. **Vacuum / Pressure gauge:** Serves three functions 1) monitoring system test pressure while in TEST mode 2) measures system Pressure-Decay once TEST or SMOKE mode completes its cycle 3) measures system Vacuum-Decay when using Vacuum-Decay function.
9. **Upper control panel lights:**
Green: READY > Turns ON indicating Tester is ready for operation (this occurs after Tester's self-calibration).

Red: SMOKE > Turns ON when SMOKE button is depressed, as long as the self- calibration process is complete.

Yellow: CHECK OIL > Emergency Low Oil light turns ON if smoke solution is depleted.
Check oil level regularly. Do NOT allow Check Oil light to turn ON.

10. **Function control buttons:** These buttons, along with the vacuum-decay (#12) function button, are the Tester's main system controls. (Figure 1)

> **.040" / .020" (1.0 mm / 0.5 mm):** Simulates these leak sizes on the flow meter, calibrating the flow meter and setting the pass / fail level for EVAP system leaks - on a 10-second timer.
> **FUTURE:** Updatable should future leak standards change.
> **TEST:** Introduces nitrogen – on a 5-minute timer.
> **SMOKE:** Introduces smoke (with nitrogen) – on a 15-minute timer. Pressing button prior to 15 minutes turns Tester OFF.

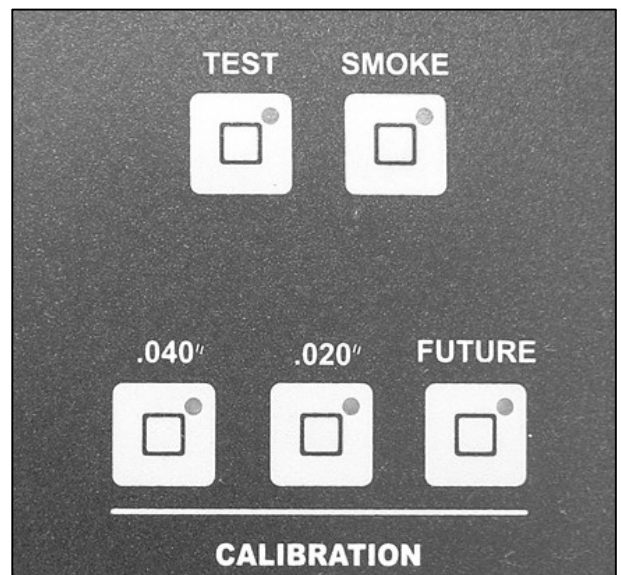


Figure 1

Tester Overview – Feature Description (continued):

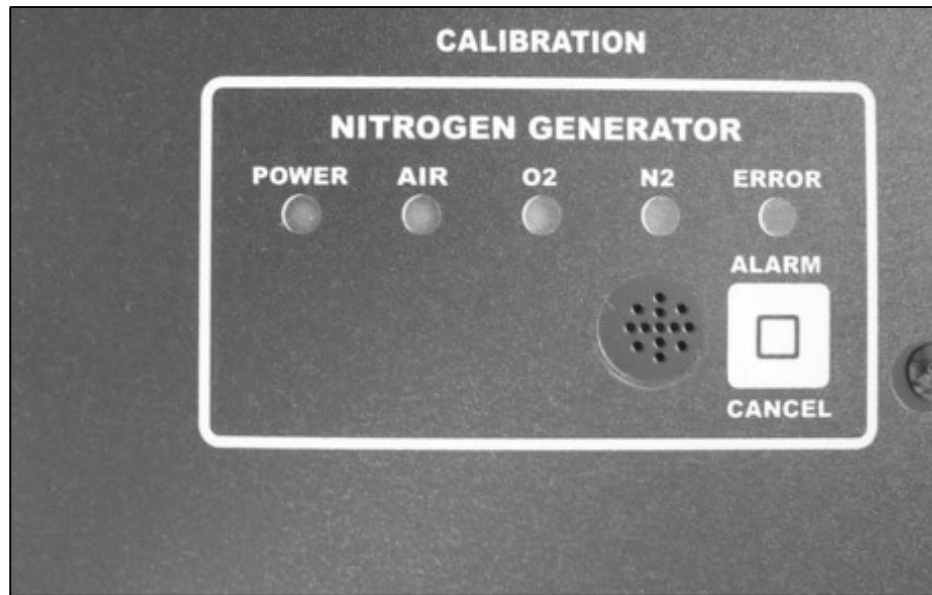


Figure 2

11. **Nitrogen Generator Diagnostic Lights:** These lights inform the operator of the status of the self-calibration process as well as Tester readiness. (Figure 2)

- GREEN: POWER > When connected to 120V AC power; all lights initially blink and an audible sound is heard indicating a system self-test has begun.
> Turns ON solid indicating good power status and initial self-test is complete.
- YELLOW: AIR > When connected to power only; light blinks indicating Tester needs to be connected to shop air or indicates there is insufficient air pressure.
> Turns ON solid when Tester is connected to power and shop air.
- YELLOW: O₂ > Blinks during oxygen sensor self-calibration (approx. 30 seconds).
> Turns ON solid once oxygen sensor calibration is complete.
- GREEN: N₂ > Blinks during nitrogen-purity calibration (approx. 50 seconds).
> Turns ON solid once nitrogen-purity is achieved – Tester is now ready for operation.
- RED: ERROR > Turns ON solid if nitrogen purity is not achieved after calibration process.
> Turns ON solid and sounds audible alarm if nitrogen purity drops below acceptable levels during Tester operation. Disconnect power to Tester for 10 seconds and reconnect to initiate calibration process again.
- ALARM / CANCEL > If fault occurs and audible alarm sounds, this button turns off audible alarm but will keep red error light on. Disconnect power to Tester for 10 seconds and reconnect to initiate calibration process again.

Tester Overview – Feature Description (continued):

12. **Vacuum-decay function button and vacuum regulator:** Button turns ON vacuum test and knob calibrates vacuum level (on 30 second timer).
13. **Remote Smoke Button:** (Not shown) Function is the same as SMOKE button on control panel.
14. **Vacuum-decay device fan:** Operates only during vacuum-decay test function to dilute / disburse fumes during vacuum test (do not restrict flow).
15. **Shop air fitting:** Connects to shop air hose. Tester's inlet pressure must be between 90 and 150 PSI (6.2 to 10.3 bar).
16. **Power Cord Plug:** Connects to grounded extension cord supplied and grounded 120-Volt AC 60 Hz wall outlet.
17. **Service Panel Door:** This is an access panel only and NOT for storage!
18. **Oxygen sensor:** Monitors the presence of oxygen in order to insure nitrogen purity.
19. **Pressure regulator / calibration adjuster:** Allows you to adjust system test pressure for calibration purposes.

Tips Prior to Performing EVAP Tests:

- **ALL tests with this Tester are performed with the engine OFF!**
- Because of the Vehicle Fuel Evaporative System's volatile fumes, you must never introduce air (containing oxygen) into a vehicle's EVAP system. This Tester will automatically produce a high-purity nitrogen when simply connected to shop air.
- Regardless of the system you are testing it is best to perform all tests in calm air so that the smoke exiting the leak(s) will not be blown away impairing your view of the leak(s).
- Most low-pressure closed systems can be tested for leaks with this Tester. You must **a)** introduce smoke into the system being tested and allow the smoke to exit out an open port (in order to make sure system is properly purged / filled) and then **b)** seal the system to be tested, in order to contain the smoke in the system being tested.
- Always completely unwind the Tester's supply hose before using it, otherwise condensed smoke vapor, in the form of liquid, will accumulate in the hose windings restricting the flow of smoke. Refer to SI B16 01 07 for additional information.

Tester Initial Setup / Preparing the Tester for Operation:

1. The Tester arrives with a commonly used male quick-disconnect air fitting. Be sure this fitting is the correct fitting for your female hose connector. (Figure 3)
> If you need to replace the fitting, use Teflon® tape on the fitting to seal the threads, being careful not to place the tape too close to the beginning of the threads where the air will travel -- that could cause a piece of the tape to break off and plug the filter.
2. Connect a filtered / clean shop air supply consisting of a pressure between 90-150 PSI (6.2 to 10.3 bar). **If your compressed air system operates using an automatic air line oiler; it must be removed from the air supply feeding the 625-522B-BMW, or it could damage its nitrogen generator.**
3. Connect power cord plug to grounded extension cord supplied and to grounded 120-Volt AC 60 Hz wall outlet.
4. Observe that the Tester's control panel lights functions have been met, as described in earlier sections, and that the Green / Ready lamp on the Tester is 'ON', confirming that the Tester is ready for operation.

Note: Any time the Tester is connected to power, it is normal to hear a gas pressure-relieve type noise about every 60 seconds, indicating a "pressure balance" during nitrogen-generation.

5. **NOTE:** Prior to using the Tester for the first time; perform a quick pressure and vacuum calibration check by following the simple instructions in Tester Pressure Calibration and Tester Vacuum Calibration sections in the following two pages of this manual. Perform these steps to make sure the Tester is properly calibrated for your location.



Figure 3

Air Fitting

Tester-Pressure Calibration:

Based on your location and local climate, it may be necessary to make a slight adjustment to the Tester's output supply pressure before you use it for the first time. You should also verify proper calibration periodically as part of a routine maintenance program.

Determining if the Tester requires pressure calibration:

1. Connect Tester to shop air pressure (between 90 to 150 psi | 6.2 to 10.3 bar).
2. Connect power cord plug to grounded extension cord supplied and to grounded 120-Volt AC 60 Hz wall outlet.
3. Allow tester to complete self-test and Green Ready light to turn ON.
4. Push and release the Tester's TEST button.
5. Restrict Tester's Supply Hose flow by placing your finger over the end of the Supply Hose Nozzle Tip or install a leak-free plug at the end of the Tester's Supply Hose Nozzle Tip.
6. The Tester's pressure gauge should read 14" to 15" of water column (w.c.). (Figure 4)

Note: Proceed to Step 7 below if the Tester's pressure is below 14" w.c.

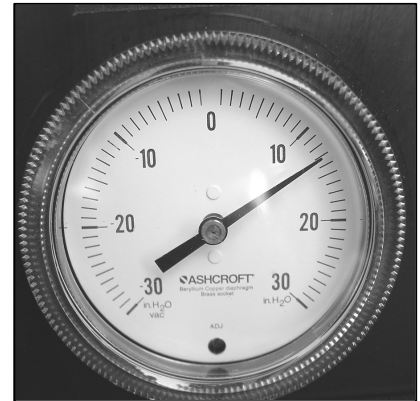


Figure 4

Adjusting System Pressure:

7. Be sure the Tester's System Pressure Gauge is indicating system pressure after having performed steps 1-6 above. (Figure 4)
8. Be sure Tester's TEST function is still ON. Use a flat-blade screwdriver to adjust the system pressure until pressure reads 14" to 15" w.c. (see figure 5)

System pressure adjustment
(located inside rear panel)
Clockwise *increases* pressure
Counter-clock *decreases* pressure

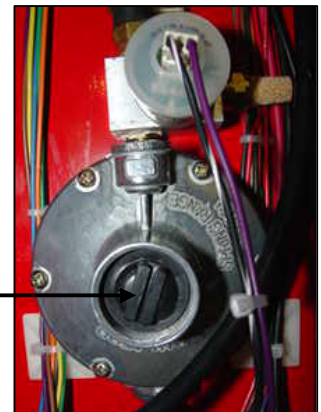


Figure 5



CAUTION: Carefully adjust the system pressure regulator by turning the adjuster in only 1/4 turns at a time. Turning the regulator plunger too far clockwise will cause the plunger to lock up; turning the regulator plunger too far counterclockwise will cause the plunger and spring to fall out of the regulator.

9. Remove the restriction from the supply hose tip for one or two seconds then once again restrict the supply hose flow. Verify that system pressure is approximately 14" w.c.; if not, repeat steps 7 and 8 above.

Phase-One – (quantifying the leak):

1. Connect Tester supply hose to vehicle EVAP system.
> Refer to SI B16 01 07 for additional information.
2. Determine if the vehicle's EVAP system you are testing is governed by a .020" (0.5 mm) or .040" (1 mm) acceptable leak standard. Press the appropriate calibration standard on the Tester's control panel (Figure 6) and observe the position of the flow meter ball. (Figure 7)
> *This function automatically turns off in 10 seconds.*

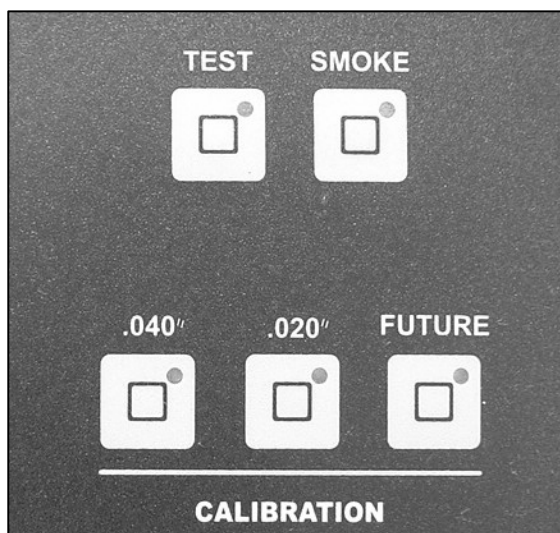


Figure 6

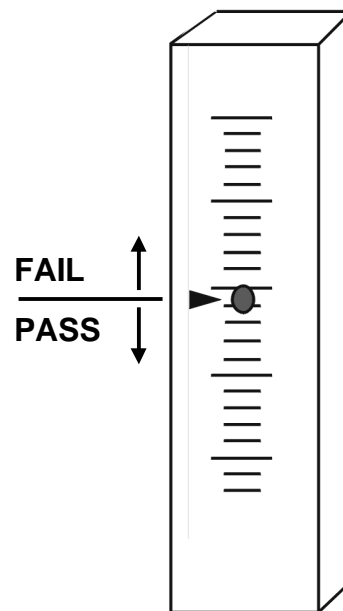


Figure 7

3. Position the flow meter's pointer flag so that it aligns with the measurement observed in step 2 above. (Figure 7)
> **This sets PASS / FAIL mark.**
4. Close vehicle's EVAP Vent Solenoid.
> Refer to appropriate vehicle application.
5. Press TEST on control panel and fill EVAP system. (Figure 6)
> *This introduces 5-minutes of nitrogen gas.*
6. Look for flow meter ball to stop descending indicating that the vehicle system is full.
> *Fill time 1-4 minutes depending on system volume.*
7. Compare flow meter ball reading to pointer flag. (Figure 7)
> **ABOVE flag = FAIL** (go to Phase-Two).
> **BELOW flag = PASS** (test complete).

Helpful Tip: You will find that a common leak in the vehicle's EVAP System is due to an unsecured or faulty fuel cap. For this reason, we recommend you do NOT disturb the vehicle's fuel cap prior to completing the Phase-One test. This way if an unacceptable leak has been determined after completing the Phase-One test, you can reposition or test the fuel cap, then perform the Phase-One test again. If you discover the leak was due to a fuel cap problem, you will have been able to identify with the symptom. Otherwise if you disturb the fuel cap prior to performing Phase-One, and the vehicle passes the test, you will never know for sure if the leak was due to the fuel cap or if you are dealing with an intermittent condition.

Testing With Pressure and Vacuum Decay:

In addition to quantifying the leak with the Phase-One flow test, the Tester allows you the flexibility of testing the vehicle's EVAP system by using either Pressure Decay or Vacuum Decay methods. Below are instructions for performing both decay tests.

Pressure-Decay Test:

Note: The Pressure Decay test is best performed immediately after the Phase-one flow test, since the system has already built up pressure.

At the completion of the Phase-one flow test, the EVAP system is fully pressurized, since the Phase-one test uses pressure to perform its flow test. Testing Pressure Decay with the Vacutec® 625-522B-BMW is very simple. All you need to do is the following:

1. Be sure the Tester has completed the Phase-one flow test by referring back to Phase-one instructions in this manual. Remember that the Phase-one test is completed when the flow meter's ball stops descending. At that time the pressure gauge will indicate full system pressure. (Figure 8)
2. If Tester is still running, turn off the Tester by pressing the TEST button and observe the pressure gauge for any decay (loss of pressure) indicating a leak in the EVAP system.
3. Use whatever standard leak rate you are guided by to determine if the leak rate is above an acceptable level.

Pressure Decay Test Limitations:

- Understand that the pressure decay test will only give you a leak or no leak result and that *quantifying* the leak with this test is not possible.

Note: Disconnect the Tester from the vehicle after testing or the increasing fuel pressure in the vehicle's fuel tank (due to fuel volatility) could cause the Tester's pressure gauge to exceed its maximum pressure reading.

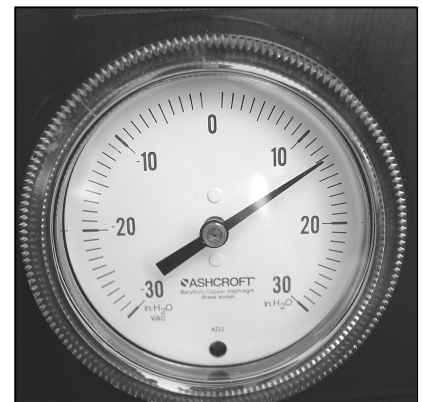


Figure 8

Vacuum Calibration:

Checking Vacuum Level Prior to Performing Vacuum Decay Test:

1. Allow tester to complete self-test and green READY light to turn ON.
2. Push and release the VACUUM button on Tester's control panel. (Figure 10)
➤ *Vacuum button is on a 30-second timer.*
3. Restrict Tester's supply hose flow by placing your finger over the supply hose nozzle tip or install a leak-free plug at the end of the Tester's supply hose nozzle tip.

Note: The Tester's factory preset calibration is approximately -12" w.c. (Figure 11)
Proceed to Step 4 below if you require a different vacuum setting.

Adjusting Vacuum Level Prior to Performing Vacuum Decay Test:

4. Be sure the Tester's System Vacuum Gauge is indicating system vacuum after having performed steps 1-3 above. (Figure 11). Press VACUUM button again if required to turn vacuum ON.
5. Locate Tester's vacuum calibration adjuster. (Figure 10)
6. Unlock the adjuster by loosening the knurled lock nut on the regulator's shaft. (Figure 10)
7. Slowly turn the knob clockwise to increase vacuum or counterclockwise to decrease vacuum until you reach the desired w.c. vacuum setting.
8. Temporarily relieve vacuum pressure in the line by removing the restriction at the supply hose nozzle. Test vacuum by once again restricting the supply hose nozzle.
9. Lock the adjuster by tightening the knurled nut.



Figure 9

VACUUM
button

Knurled
lock nut

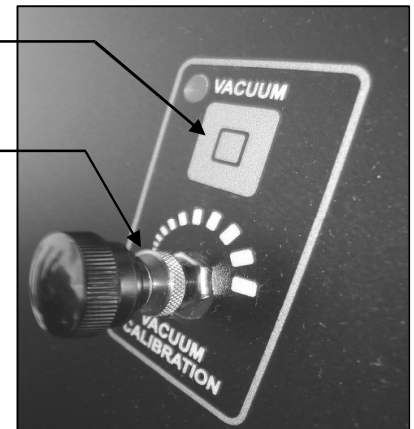


Figure 10

Vacuum-Decay Test:

1. Allow tester to complete self-test and green READY light to turn ON.
2. Connect Tester supply hose to vehicle.
 - > Refer to SI B16 01 07 for additional information.
3. Press VACUUM switch on Tester's control panel. (Figure 10)

Note: The vacuum switch is on a 30-second timer, which should be sufficient time to draw the appropriate vacuum from the EVAP system. Press VACUUM switch again if additional time is required.

4. After vacuum timer turns off, observe the vacuum gauge for any decay (loss of vacuum) indicating a leak in the EVAP system. (Figure 11)
 - > Use whatever standard leak rate you are guided by to determine if the leak rate is above an acceptable level.

Note: Disconnect the Tester's supply hose from the vehicle immediately after the Vacuum Decay Test. The fuel pressure in the vehicle's fuel tank is constantly changing due to the vehicle's fuel volatility and that could cause the Tester's pressure gauge to exceed its maximum reading limits, damaging the gauge.



Figure 11

Phase-Two – (identifying the leak):

1. Allow tester to complete self-test and green READY light to turn ON.
2. Connect Tester supply hose to vehicle EVAP system.
 - > Refer to SI B16 01 07 for additional information.
 - > For best Tester performance; completely unwind Tester's supply hose.
3. Remove the vehicle's fuel cap prior to introducing smoke into the EVAP system
4. Press SMOKE on control panel to fill EVAP system with smoke vapor.
 - > *The control panel SMOKE light will light indicating smoke production.*
 - > *The SMOKE setting is on a 15 minute timer. Pressing the SMOKE button again turns Tester off.*
 - > It is normal for the flow meter ball, while in the SMOKE mode, not to be as steady as when it is in the TEST mode.

Note: The pressure gauge is active only after SMOKE cycle is complete.

5. Secure the fuel cap AFTER smoke is observed exiting the fuel tank's neck area.
 - > *The removal of the fuel cap prior to introducing smoke insures faster filling of the EVAP system.*
7. Continue introducing smoke into the EVAP System until the flow meter's ball stops descending. This assures the system test pressure is met.
8. Follow the EVAP system path with the halogen light provided and look for the smoke exiting the leak(s) or use the UV light provided and look for the dye deposited at the exact location of the leak(s).
9. Repair the leak(s) and perform the Phase-One flow test again (or either decay test) to verify repair, as well as to make sure there are no additional leaks in the EVAP system.
 - > *The UltraTraceUV® smoke solution's dye feature is especially helpful when the leak is in an area that is not readily visible, as on the top of the fuel tank or behind a panel. Once you gain access to the area of the leak, wear the yellow UV glasses and shine the UV light provided to identify the exact location of the leak(s).*
 - > *Smoke exiting a very small leak is even easier to see with lower pressure. If you encounter smoke leaking out of an area but find it difficult to pinpoint exactly where the source of the leak is; try reducing the pressure in the system being tested by turning the Tester OFF and allow the pressure to dissipate.*
 - > *The longer a particular leak is allowed to leak, the more fluorescent dye material will be deposited at that leak.*

Maintaining Proper Oil Level:

Similar to checking and topping off the oil in a vehicle's engine, you should maintain the Tester's solution level at the **FULL** mark (Figure 12). Always use solution part number P0716UV which can be ordered from 1.888.222.7997.

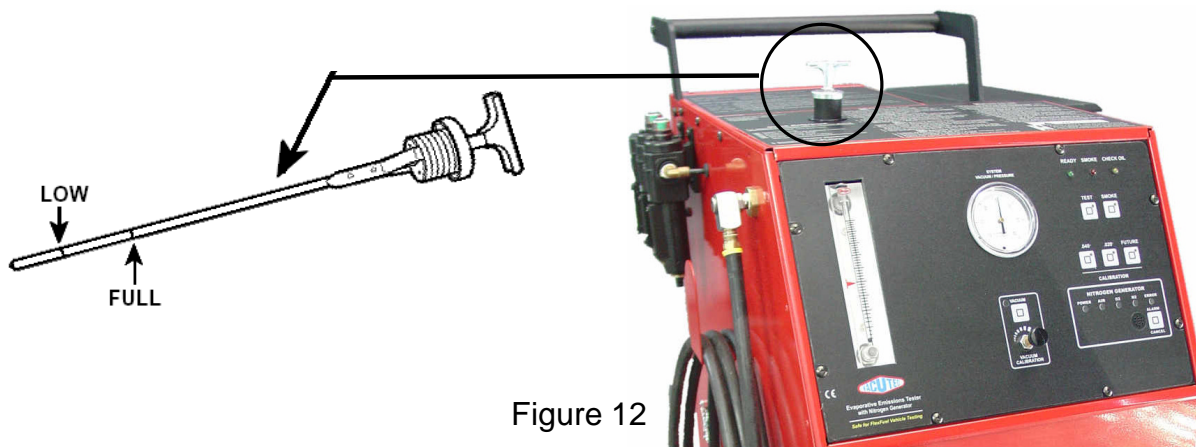


Figure 12



Do not attempt to introduce a solution into the Tester that is not recommended by the manufacturer because it could damage the vehicle! It will also void the Tester's warranty; could cause harm to the operator and may damage the Tester!

Yearly Maintenance – Replace Filters and Oxygen Sensor:

It is very important to keep the Tester's nitrogen generator assemblies free of oil, water and other contaminants, in order to maintain a high nitrogen purity and long service life. In order to do that, you need to be sure and maintain a clean filter system on your air supply into the Tester.

You must replace the filter elements inside filter assemblies #1, #2 and #3 once a year, or sooner if moisture or restriction is present, indicated by a red band seen in top view window of filter #2. Use only approved filter elements noted in Replacement Parts list on page 21 of this manual. Turn filter bowl ¼ turn in counter-clock direction to gain access to the filter element. (Figure 13)



Figure 13

Filter #1 #2 #3

Replace oxygen sensor once a year:

1. Removed power cord from the 120 volt supply.
2. Remove oxygen sensor's electric plug.
 > *Grab the plug not the wires!*
3. Unscrew oxygen sensor (counter-clock).
4. Screw in new oxygen sensor.
5. Replace electric plug.
6. See O2 Calibration Instructions on pages 17-18.

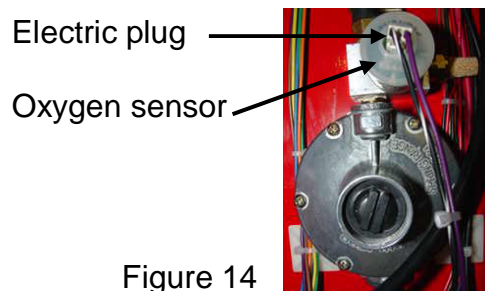
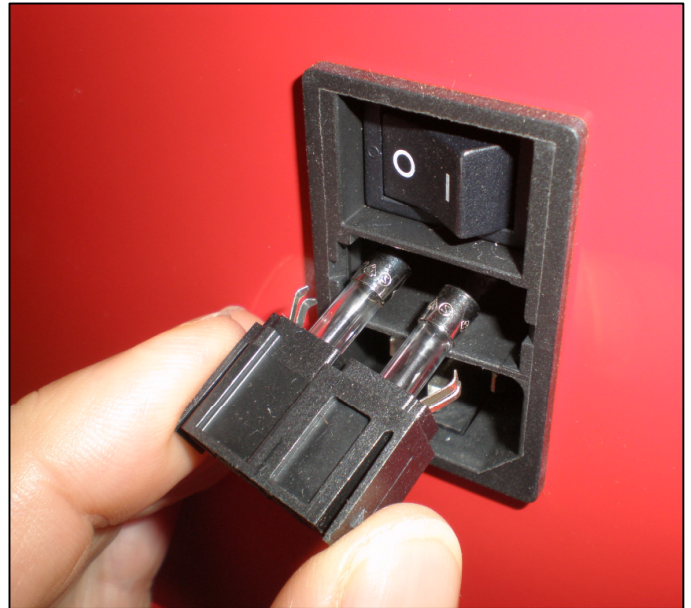


Figure 14

Fuse Replacement:

1. Removed power cord from the 120 volt supply.
2. Unplug power cord from Tester.
3. Remove fuse box by pinching outer sides of box.
4. Replace with 250V-IEC 5A fuse, obtained at most electronics stores, or from us with Part No. 030-F2395-ND. (Two fuses required).



The Vacutec® 625-522B-BMW has three diagnostic lights on the upper-right section of the control panel which indicate basic functions. The following tables describe the Tester's trouble codes.

Upper Panel Lights:

Green	Red	Yellow	Interval	Causes
		✓	Constant ON	Low on Smoke Solution
✓			Constant ON	No problems – system ready
✓			Blink: 1 per second	Insufficient power
✓	✓		Blink simultaneously: 1 per second	Bad ground at canister or at circuit board. Power connection loose or short in heating circuit
✓	✓		Blink simultaneously: 4 per second	Bad ground at canister or at circuit board. Open heating circuit
✓	✓		Blink alternately: 1 per second (System will automatically shut down.)	Bad ground at canister or at circuit board. Vapor control circuit*
* If this fault occurs, first try disconnecting power to the Tester for 10 seconds and reconnect. Allow system to self-calibrate and green READY light to turn ON. If failure code occurs a second time, disconnect Tester and contact manufacturer.				

Vacuum test Button Light:

A blinking light indicates a faulty vacuum fan function.

Nitrogen Generator Diagnostic Lights:

These five diagnostic lights indicate the proper functionality of the nitrogen generator and are best described on page 5 of this manual.

NOTE: If Tester's O₂ Sensor fails to properly calibrate after approximately one minute (indicated by a continually blinking O₂ Sensor light), that indicates the O₂ Sensor requires recalibration or replacement. Replace the O₂ Sensor only if the recalibration fails to calibrate the Sensor. Follow recalibration instructions on next page.

If the Tester will not turn ON, it could indicate a faulty fuse. See Fuse Replacement instructions on previous page.

Oxygen (O₂) Sensor Calibration

NOTE: If O₂ light on your Tester's control panel continues to blink, indicating a faulty O₂ sensor, follow instructions below to:

- I) Recalibrate the O₂ sensor in your Tester
 - II) Determine if the O₂ sensor is faulty
 - III) Replace the O₂ sensor and calibrate new sensor
-

I) Prior to installing a new O₂ Sensor; follow these steps to determine if your Tester's O₂ can be recalibrated.

Helpful Tip > Familiarize yourself with steps 5-7 in this section before performing step 1.

1. Turn Tester's power 'OFF'.
2. Push and hold alarm button (figure A).
3. Turn Tester's power 'ON'.
4. Once Power light stops flashing, and turns 'ON' solid, release alarm button (figure A).

The next 3 steps must be completed within 15 seconds after the power light turns 'ON' solid.

5. Open the rear cabinet door (figure B).
6. Locate circuit board (figure B).
7. Press calibration button on the circuit board until buzzer sounds (figure C).
8. **Calibration of O₂ is now complete!** This triggers the calibration of the N₂. After 50 seconds, the N₂ light will go solid and Tester is once again ready for operation.

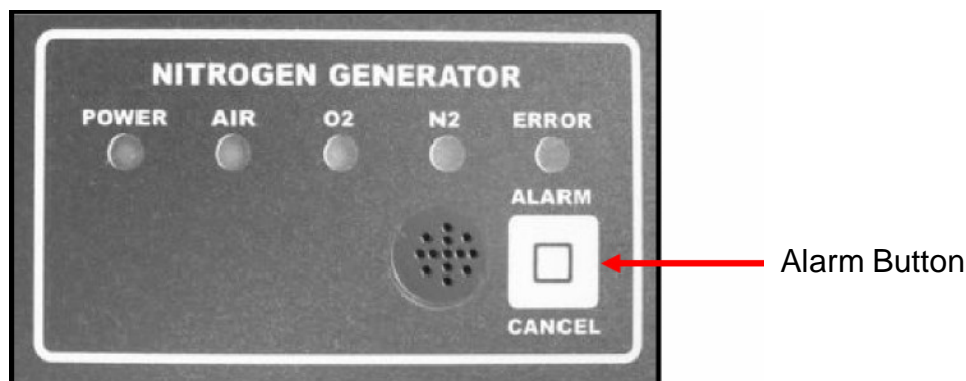


Figure A

NOTE: If step 'I' above failed to recalibrate the O₂ Sensor, proceed to step 'II'.

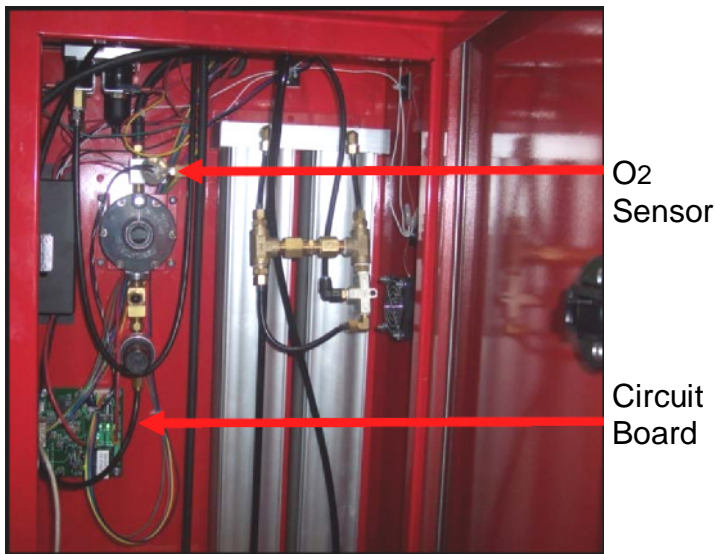


Figure B

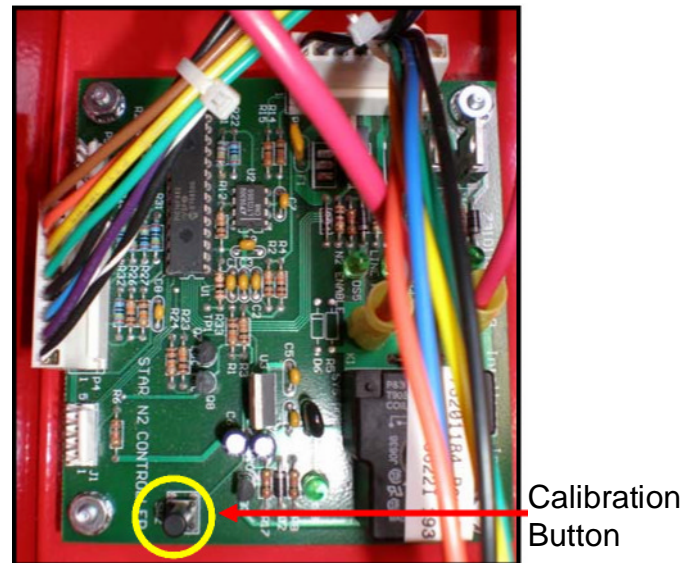


Figure C

II) Determining if your O2 sensor is faulty (was not able to recalibrate).

1. Turn Tester's power 'OFF'.
2. Remove O2 sensor's electric plug (figure D). Note: Grab the plug, not the wires!
3. Set Voltmeter to 200mv scale and probe the two outer terminals (figure E).
 - This procedure can also be performed with the O2 sensor removed from the Tester.
4. If voltage is below 6mv, the O2 sensor has failed and needs to be replaced.

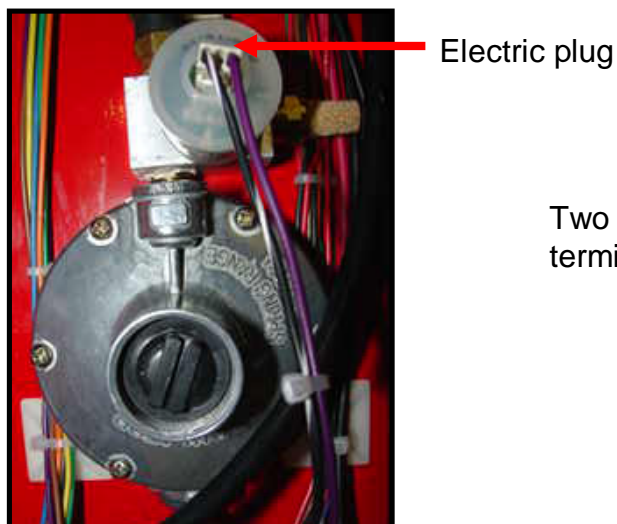


Figure D

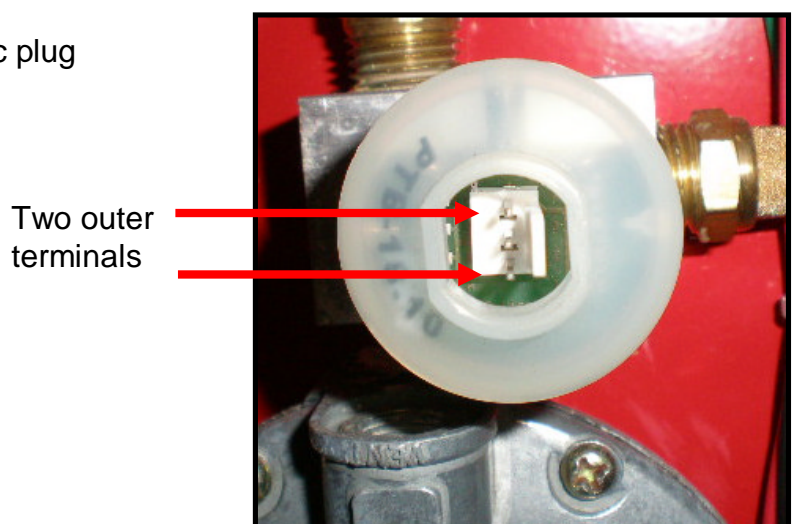


Figure E

III) Replace O2 sensor. Be very careful not to cross-thread during installation. Calibrate the new O2 sensor by following steps 1-8 in section 'I' which starts on previous page.

Evaporative System Test & Diagnosis: Quick Reference

EVAP Test Overview

A: Tester Hookup.

B: Phase-One; quantifying the leak(s).

C: Pressure Decay Test.

D: Vacuum Decay Test.

E: Phase-Two; identifying the leak(s).

A: Tester Hookup

1. Connect power cord to 120-Volt AC power.
2. Connect a clean dry source of shop air to Tester.
3. Allow Tester to self-calibrate and green READY light to turn ON.

B: Phase-One Test

1. Follow Tester Hookup procedure.
2. Completely unwind Tester's supply hose.
3. Connect Tester's supply line to EVAP system.
 - > Refer to SI B16 01 07 for additional information.
4. Press appropriate calibration (.020" / .040") on control panel.
5. Align flow meter's pointer flag with ball.
 - > *This sets PASS / FAIL mark.*
6. Press TEST on control panel and fill vehicle system.
 - > *This introduces 5-minutes of nitrogen.*
 - > *Pressing TEST again turns Tester off.*
 - > *Do NOT disturb vehicle's fuel cap.*
7. Observe flow meter's ball until it stops descending, indicating system is full.
 - > *Fill time 1-4 minutes depending on system volume.*
8. Compare flow meter ball reading to pointer flag position.
 - > *ABOVE flag = FAIL (go to Phase-Two).*
 - > *BELOW flag = PASS (test complete).*

C: Pressure Decay Test

NOTE: Pressure Decay Test is best performed immediately after the Phase-One flow test, since system is already pressurized.

1. Be sure Tester has completed the Phase-One Test.
 - > *Phase-One Test has completed when flow meter ball has stopped descending.*
2. If Tester is running, turn Tester off by pressing the TEST button.
3. Observe pressure gauge for decay, indicating a leak.
4. Use predetermined decay rate to determine if acceptable.

D: Vacuum Decay Test

1. Follow Tester Hookup procedure.
2. Connect Tester to vehicle's EVAP system.
 - > Refer to SI B16 01 07 for additional information.
3. Press VACUUM button on Tester.
 - > *Vacuum functions on 30-second timer.*
4. When vacuum timer turns off; observe vacuum gauge for decay, indicating a leak.

E: Phase-Two Test

1. Follow Tester Hookup procedure.
2. Completely unwind Tester's supply hose.
3. Connect Tester's supply line to EVAP system.
 - > Refer to SI B16 01 07 for additional information.
4. Remove the vehicle's fuel cap.
5. Press SMOKE on control panel.
 - > *This introduces 15-minutes of smoke vapor.*
 - > *Pressing SMOKE again turns tester OFF.*
6. Install fuel cap *after* smoke is seen exiting the fuel tank neck, assuring the EVAP system has filled with smoke.
7. Continue introducing smoke until leak is found.
 - > *Use halogen light supplied and follow EVAP system path to look for exiting smoke identifying the leak(s).*
 - > *Use ultraviolet (UV) light supplied and wear yellow glasses to see fluorescent dye deposited at exact location of leak(s).*
 - Note: The longer the smoke test is allowed to run, the more fluorescent dye will be deposited at the leak(s).
8. Repair leak(s) and perform Phase-One test again to verify problem has been resolved.

Accessories and Replacement Parts List

Accessories included with the Vacutec® 625-522B-BMW	
Part No.	Description
P0716UV	UltraTraceUV® Smoke Solution (16oz) (Tester arrives full. One extra bottle is supplied)
WVA-01	(2 included w/ Tester) Exhaust Cone Adapter (1" to 3 1/2") Diameter)
WVA-02	Assorted Cap-plug Set
WVA-03	Smoke Diffuser (for finding wind/water leaks)
HS400AC	400,000 CP Halogen Spot Lamp (20' power leads & clips)
WVA16345	Twelve LED hi-intensity true UV light. Includes battery charger and UV enhancing glasses.
WVA0400-3115	Vacuum / Pressure Fitting

Additional accessories included with the Vacutec® 625-522B-BMW				
Part No.	Description	OD Large End	OD Small End	O'all Ht.
WVA9545K81	Tapered Solid Rubber Plug	3 35/64"	2 61/64"	1 17/32"
WVA9545K82	Tapered Rubber Plug w/ 13/64" hole	3 35/64"	2 61/64"	1 17/32"
WVA9545K85	Tapered Solid Rubber Plug	4 3/64"	3 17/64"	1 17/32"
WVA9545K86	Tapered Rubber Plug w/ 13/64" hole	4 3/64"	3 17/64"	1 17/32"
WVA6448K62	Tapered Solid Rubber Plug	1/4"	1/8"	3/4"
WVA6448K63	Tapered Solid Rubber Plug	11/32"	3/16"	5/8"
WVA6448K65	Tapered Solid Rubber Plug	1/2"	5/16"	13/16"
WVA6448K66	Tapered Solid Rubber Plug	21/32"	1/2"	1"
WVA6448K67	Tapered Solid Rubber Plug	3/4"	9/16"	1"
WVA6448K69	Tapered Solid Rubber Plug	15/16"	23/32"	1"

Replacement Parts	
Part No.	Description
WVRP-32	Cable's on / off switch (does not include cable assembly)
WVRP-333	Tester's supply hose and nozzle - complete
WVRP-SN5838	Tester's supply hose nozzle (no hose)
WVRP-DS616	Dipstick
WVRP-37	Flow meter's pointer flag
WVRP-5925-03	Filter element #1 (5 micron)
WVRP-5925-09	Filter element #2 (.01 micron)
WVRP-5925-09C	Filter element #3 (Charcoal filter)
WVRP-4380-500	Dual O-ring kit for housing of filters #1, #2 or #3 (one O-ring kit required per filter)
WVRP-00A101	Oxygen sensor
030-F2395-ND	Fuse (two required). Available at electronics supply with spec: 250V-IEC 5A

Warranty

For Technical Support

1-888-822-8832 (Opt. #2)

Mon.-Fri. 8:30am to 4pm Pacific Time

TechSupport@vacutec.com

LIMITED ONE (1) YEAR WARRANTY

Manufacturer Part No. : Vacutec® 625-522B-BMW

Worldwide Vapor, Inc. warrants the Vacutec® only to the Original Purchaser that under normal use, care and service, the Equipment (except as otherwise provided herein) shall be free from defects in material and workmanship for ONE YEAR from the date of original invoice.

This Warranty does not cover (and separate charges for parts, labor and related expenses shall apply to) any damage to, malfunctioning, inoperability or improper operation of the Equipment caused by, resulting from or attributable to (A) abuse, misuse or tampering; (B) alteration, modification or adjustment (other than calibration) of the Equipment; (C) installation, repair or maintenance (other than specified operator maintenance) of the Equipment or related equipment, attachments, peripherals or optional features by other than Seller's authorized representatives; (D) improper or negligent use, application, operation, care, cleaning, storage or handling; (E) fire, water, wind, lightning or other natural causes; (F) adverse environmental conditions, including, without limitation, excessive heat, moisture, corrosive elements, or dust or other air contaminants; radio frequency interference; electric power failure; power line voltages beyond those specified for the Equipment; unusual physical, electrical or electro-magnetic stress; and/or any other condition outside of Seller's environmental specifications; (G) use of the Equipment in combination or connection with other equipment, attachments, supplies or consumables not manufactured or supplied by Seller.

NO OTHER WARRANTIES, EXPRESS, IMPLIED OR STATUTORY, INCLUDING WITHOUT LIMITATION ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, SHALL APPLY, AND ALL SUCH WARRANTIES ARE HEREBY EXPRESSLY EXCLUDED.

Seller's obligations under this warranty are limited solely to the repair or, at Seller's option, replacement of or refund of the original purchase price for, Equipment or parts which to Seller's satisfaction are determined to be defective and which are necessary, in Seller's judgment, to return the equipment to good operating condition.

Repairs or replacements qualifying under this Warranty will be performed or made on regular business days during Seller's normal working hours within a reasonable time following Buyer's request. All requests for warranty service must be made during the stated warranty period.



This product contains STAR licensed technology, *inside*.