BOSCH
Invented for life

SMT500 Leak Detector
Operating Instructions

boschdiagnostics.com

Safety Precautions

BEFORE OPERATING THIS TOOL, ALL OPERATORS SHOULD READ AND UNDERSTAND THIS DOCUMENT AND FOLLOW ALL SAFETY WARNINGS AND INSTRUCTIONS.

KEEP THESE INSTRUCTIONS WITH THE TOOL FOR FUTURE REFERENCE. IF YOU HAVE ANY QUESTIONS, CONTACT YOUR BOSCH REPRESENTATIVE OR DISTRIBUTOR.

⚠ DANGER

When an engine is operating, keep the service area well ventilated or attach a building exhaust removal system to the engine exhaust system. Engines produce carbon monoxide, an odorless, poisonous gas that causes slower reaction time and can lead to death or serious personal injury.

⚠ WARNING:

- **All diagnostic work should be performed with the engine off**
- **Do not leave a vehicle unattended while equipment is connected or operating**
- **Operates on a 12-volt battery: connect to battery (+) and chassis ground (-)**
- **Vapor chamber can become hot. Do not lift or carry by vapor chamber**
- **Do not perform tests near a source of spark of ignition**
- **When working with the fuel system, work in a well-ventilated area**
- **Always wear the appropriate safety protection**
- **Wear OSHA standard eyewear and protective gloves when using this equipment**
- **When working with hydraulic or fuel lines, be careful that liquids under pressure do not escape and create a dangerous condition. Use adequate ventilation and make sure there are no sparks or possibility of sparks that may ignite any vapor.**
- **Wear an American National Standards Institute (ANSI) Z87.1 approved eye shield when testing or repairing vehicles.**
- **Objects propelled by whirling engine components or pressurized liquids escaping may cause personal injury.**
- **Set the parking brake and block the wheels before testing or repairing a vehicle. It is especially important to block the wheels on front-wheel drive vehicles because the parking brake does not hold the drive wheels.**
- **Do not drive the vehicle and operate the software at the same time.**
- **Maintain adequate clearance around moving components or belts during testing.**
- **Moving components and belts can catch loose clothing, body parts, or test equipment and cause serious personal injury or tool damage.**
- **Automotive batteries contain sulfuric acid and produce explosive gases that can result in serious injury due to ignition of gases. Keep lit cigarettes, sparks, flames, and other ignition sources away from the battery at all times.**
- **Refer to the service manual for the vehicle being serviced. Adhere to all diagnostic procedures and precautions. Failure to do so could result in personal injury or otherwise unneeded repairs.**
- **Use only specially designed replacement parts (brake hoses and lines) for ABS equipped vehicles.**
- **After bleeding the brake system, check the brake pedal for excessive travel or a ”spongy” feel. Bleed again if either condition is present.**
- **When installing transmitting devices (Citizen Band radio, telephone, etc) on ABS-equipped vehicles, do not locate the antenna near the ABS control unit or any other control unit.**
- **This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates and radiates radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications.**
- **Do not operate the tool with a damaged cord or connector. Replace damaged cords and connectors immediately.**
- **Do not expose tool to rain, moisture, or snow.**
- **Verify that cords are located where they will not be stepped on, tripped over, or otherwise become a safety hazard or subjected to damage or stress.**
- **Do not store or leave your tool near a heat source such as a radiator, fireplace, stove, electric heater, or other heat-generating appliance or otherwise expose it to temperatures in excess of 60ºC (140ºF). When heated to excessive temperatures, battery cells could explode or vent, causing personal injury or risk of fire.**

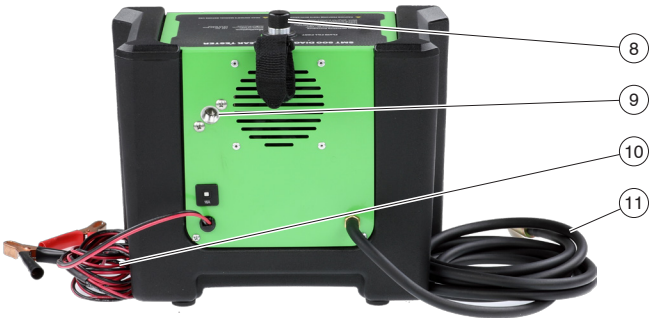
CAUTION:

- **Do not place the tool on the distributor of a vehicle. Strong electromagnetic interference can damage the tool.**
- **Never disconnect or reconnect any electrical connector while the ignition is on. Powertrain Control Module (PCM) damage may result.**

Specifications

L x W x H	8 in. x 10 in.x 12.5 in. (20 cm x 25 cm x 33 cm)
Weight	10.3 lb (4.5 kg)
Shipping weight	18 lb (8 kg)
Power supply	12 volts DC; input power supply 11.5–14 VDC
Power consumption	8 amps
Output pressure	0.47 PSI / 13.0 in. H20 / 0.032 BAR
Operating temperature	30°F to 115°F (-1°C to 46°C)
Operating humidity	No restrictions
Operating altitude	No restrictions
Vapor output hose	10 ft (3 m)
Power supply cables	10 ft (3 m)
Operating modes	Vapor test cycle/Air only test cycle
Pressure Supply	Onboard micro air compressor
Micro-compressor duty cycle	100%
Housing material	High-impact PC/ABS polycarbonate
Vapor chamber material	Billet aluminum
Vapor chamber assembly	Bolted
Vapor chamber warranty	Lifetime

Reference Guide



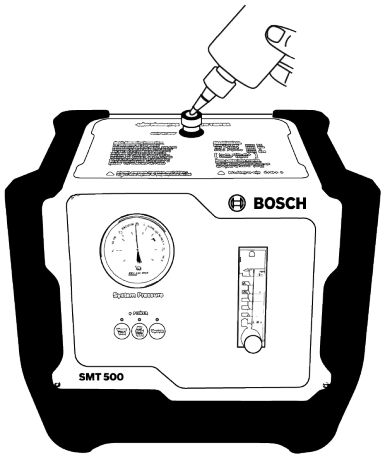
1. **Compound pressure gauge**
   - Indicates amount of pressure or vacuum
   - Allows for decay/leak down test to confirm repair is 100% complete
2. **Flow meter**
   - Measures leak size as small as 0.010-in.
3. **Flow control knob**
   - Open flow control valve to allow vapor/ pressure into the system
   - Close flow control valve to lock out system for pressure decay testing
4. **Reset button**
   - Used for service functions only
5. **Air-only test button**
   - Begins 5-minute air-only cycle to test without vapor
   - Blue light indicates onboard microcompressor is generating air-only
6. **Vapor test button**
   - Begins 5-minute vapor cycle
   - Red light indicates vapor cycle
   - Push again to stop testing
7. **Power indicator light**
   - Green light indicates adequate power
8. **Fluid fill port**
   - Turn counter clockwise to remove dipstick
9. **External gas input**
   - 1/4-in. NPT threaded port
   - Connects external compressed gas (inert gases such as nitrogen or CO2)
10. **Battery power cables**
    - Connects to 12-Volt DC battery(+) and chassis ground(-)
11. **Vapor output hose**

Accessories

OEM-Approved Vapor-Producing Fluid Vapor-producing fluid will perform over 1,000 typical tests (500+ per bottle) IMPORTANT: Contains no dye/contaminants	169500005	
Schrader Valve Removal Tool	6522-5	
EVAP Service Port Adapter	6522-4	
Daylight Spectrum LED Cordless Light Bright white beam finds even the tiniest wisps of vapor under the hood or chassis	SMT-01	
Cap Plug Kit Seals a variety of openings to pressurize system for testing	6522-6	
Easy INTAKE™ Award-winning Easy INTAKE™ is an inflatable block off bladder with a pressurized vapor pass-through that allows technicians to test an entire intake or exhaust system quickly and easily	SMT-02	

Setup

FILL/ADD VAPOR PRODUCING FLUID



1. Remove fluid fill dipstick.
2. Pour vapor producing fluid into fluid fill port until fluid level is near top of the fill line on the dipstick.
3. Replace fluid fill dipstick

Do not overfill.

Notes:
- *First time fill requires approx. 2 oz (60 ml).*
- *Check fluid level every 75–100 tests.*
- *Never use dyes, solvents, or other contaminants in intake or exhaust systems. They may coat and/or harm critical sensors and catalysts.*
- *Fill fluid to maximum fill line on dipstick.*

CONNECT TO POWER

This machine runs on a fully-charged 12-volt battery.

1. Connect red lead (+) to battery's positive terminal.
2. Connect black lead (-) to chassis ground.

Do not connect to battery charger.

Power indicator light:

●	Solid green light	Machine has adequate power
◉	Flashing green light	Improper power; supplied voltage is too high or too low
○	No light	No power. See Troubleshooting

Testing for Leaks

TESTING WITH SMOKE

1. Connect vapor output hose to system that is to be tested. See Diagnostics section for more detail.
2. Push vapor test button to begin a 5-minute vapor cycle

Vapor indicator light:

●	Solid red light	Vapor is being generated
◉	Flashing red light	See Troubleshooting
○	No light	No vapor is being generated

3. Turn Flow Control Knob counter-clockwise to release smoke / pressure

Note: Flow meter indicates flow and measures leak size.

4. Use provided Halogen Inspection Light to locate leaks
5. Perform repair(s) as needed

TESTING WITH AIR-ONLY

1. Connect vapor output hose to system that is to be tested. See Diagnostics section for more detail.
2. Push air-only test button to begin a 5-minute vapor cycle.

Air-only indicator light:

●	Solid blue light	Machine has adequate power

3. Turn flow control knob counter-clockwise to release pressure.

Note: Flow meter indicates flow and measures leak.

Verify Repairs

PERFORM DECAY / LEAK DOWN TEST

1. Pressurize the sealed system.
2. Lock out system by turning flow control knob clockwise to the fully closed position.

OBSERVE PRESSURE GAUGE FOR DECAY

	Pressure holds	No leaks; repair complete
	Pressure decreases	Leak(s) exist; repair necessary

NOTE: Not all systems are designed to be 100% sealed.

Diagnostics

Intake System and Vacuum Leaks

This procedure will locate leaks in vacuum lines as well as manifolds, EGR valves, oil seals, gaskets, solenoids, o-rings, ducting, throttle shafts, diaphragms, canisters, and more.

Note: For best results, test in a draft-free area.

1. Remove the air filter housing from ducting.
2. If the vehicle has a round inlet tube from the air filter, place the cone adapter into the duct toward the engine.
3. Put the vapor supply hose into cone adapter to introduce vapor into the system.
4. Use daylight spectrum LED cordless light to locate leaks.

Alternative method:

1. Select an appropriate vacuum line to access the vacuum system (i.e. a brake booster supply line before the check valve).
2. Seal all system openings.
   - Air Intake must be sealed to prevent vapor from leaking back through the intake.
   - To seal the intake, use cap plugs, a latex glove, or plastic wrap around the filter.
3. Put vapor output hose into cone adapter to introduce vapor into the system.
4. Use daylight spectrum LED cordless light to locate leaks.

EVAP Leaks

Leaks in the EVAP system, or fuel vapor recovery system, are frequently the cause for check engine lights. Using a diagnostic leak detector, these leaks can now be quickly diagnosed and repaired, making them profitable services for repair facilities.

1. To access the EVAP service port, remove the green cap.
2. Remove Schrader valve using the Schrader valve removal tool.

Note: Schrader valve has left-handed threads; turn clockwise to remove.

3. Connect the EVAP service port adapter to the service port.
4. Use a scan tool to close the vent solenoid to close EVAP system from atmosphere. (If vent solenoid does not close, intermittent solenoid may have failed.)

5. Input vapor into the system through adapter.
6. Remove the fuel cap until dense vapor is exiting the filler neck.
7. Replace the fuel cap and continue pumping vapor into the system.
8. As the system fills with vapor and the system pressure equalizes, observe the flow meter and pressure gauge.
9. When pressure gauge reaches its maximum pressure, the flow meter will indicate leak size.

Note: Flow meter will drop to zero if there are no leaks.

10. Use the daylight spectrum LED cordless light to inspect under the hood and trace the route of the EVAP system on the underside of the vehicle for leaks.
11. Repair the system as needed.

After all repairs have been made, retest the system using the decay or leak down testing method with air only.

12. Input air into EVAP system until fully pressurized.
13. Lock out system by turning the flow control knob to the fully closed position.

If leaks are repaired properly, system will hold pressure.

If pressure decays or leaks exist, repeat above procedures until all repairs are complete.

Exhaust Leaks

This test is most effective when exhaust system is cold; thermal expansion may cause small leaks to seal.

1. Insert Easy INTAKE™ into the end of the tailpipe. If the vehicle has dual exhaust with cross over system, plug the other tailpipe to seal the system.
2. Put vapor output hose into Easy INTAKE™ to introduce vapor into the system.

Note: A hot catalytic converter may consume some of the smoke.

All testing is performed with the engine off.

Under-Dashboard Leaks

Many vehicles have a common vacuum line, leading from the engine compartment through the firewall, under the dashboard.

This line supplies vacuum to climate control functions and other vacuum-operated systems.

1. Disconnect the vacuum line, under the hood, at its source.
2. Input vapor into the vacuum line.
3. Observe the flow meter and pressure gauge while changing the climate controls from heat to vent, to defrost, etc.

Note: Change in the flow meter or pressure gauge reading will indicate which system is leaking.

4. Set the climate control to the leaking system.
5. Use the daylight spectrum LED cordless light to locate under-dash leaks.

Central locking system leak inspection is performed in the same manner.

Activate control solenoids while introducing vapor into the system.

Maintenance

Check Fluid Level

1. Remove fluid-fill plug from fluid fill port.
2. Pour OEM-approved vapor agent into fluid-fill port until fluid level is near top of the fluid-fill port.
3. Replace fluid-fill plug.

Check fluid level every 75–100 tests.

Clean Flow Meter

1. Disconnect air supply and power from the machine.
2. Remove the flow meter's top plug.
3. Invert the machine to remove flow meter ball.
4. Apply isopropyl/rubbing alcohol to a long cotton swab to clean flow meter tube.
5. Use a dry cotton swab to dry flow meter tube.
6. Wipe flow meter ball clean with dry cloth.

⚠ **Do not use alcohol / cleaners on flow meter ball.**

7. Reinstall the flow meter ball and the top plug.

Drain Vapor Hose

1. Elevate the machine
2. Allow the entire vapor hose to hang downward.
3. Place a container beneath the nozzle to capture fluid.

Draining the vapor hose takes approximately 5 minutes.

Troubleshooting

Problem	Solution
No green light	• Check polarity • Ensure 12-volt battery is fully charged • Reconnect power cables
Green light flashing	• Power supply must be between 11.5 and 14 VDC • Connect to a fully charged 12-volt battery • Never use battery charger as power source
Amber or red light flashing	• Open circuit/internal component • Contact technical support
No air flow	• Open the flow control valve • Ensure hoses are not kinked or pushed into machine
Insufficient vapor	• Check fluid level • Open the flow control valve • Ensure hoses are not kinked or pushed into machine
Flow meter ball sticking	• Tap face of flow meter • If problem persists, clean flow meter
Gauge bouncing or flow meter bouncing	Drain vapor hose
High pressure reading	Ensure hoses are not kinked or pushed into machine

Notes

Bosch
Automotive Service Solutions Inc

Customer Service: 800-321-4889 Option 4, then 2

www.boschdiagnostics.com

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