

EEEA501A
NOx Single Gas Analyzer

Operator's
Manual

Effective 7/6/01



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Blue-Point.

Manufactured for Snap-on® Tools
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Safety Messages

Read, understand and follow these instructions completely before using the analyzer and follow all of the safety messages. Keep this manual for future use.

In the interest of safety, the equipment and sampling procedures described in this manual should only be undertaken by competent trained personnel after due consideration of the potential hazards.

Danger

The gases this analyzer is sampling are injurious to health at relatively low concentrations.

- **Do not breathe exhaust gases**
- **Use in well ventilated area (four turns per hour) or use outside**
- **Read, understand and follow this operator's manual**

Breathing exhaust gas can cause death or serious injury

Warning

Exhaust probe, probe exterior and tailpipe can be hot.

- **Do not touch hot probe in tailpipe. Allow time for them to cool down.**

Hot parts can cause injury.

Inattentive driving can cause an accident.

- **Use in low traffic or with observer.**

Driving accidents can cause injury.

Sample condensate can be acidic.

- **Wear safety goggles.**
- **Do not let condensate contact body. Rinse area contacted by condensate with water and seek medical attention.**

Acidic condensate can cause injury.

Caution

Improperly attached parts can cause flying debris.

- **Secure analyzer components to vehicle tailpipe and body.**

Flying debris can cause damage.

Erratic, questionable or erroneous test information may lead to incorrect repair or adjustment.

- **Use analyzer per operator's manual.**

Improper use may cause injury or damage to vehicle.

1. Introduction

The Bluepoint® NOx Gas Analyzer is a portable battery powered vehicle monitoring system. Use the instrument to monitor the exhaust emissions while tuning the engine in the garage and out on the open road.

Its features include:

- Ruggedized instrument casing with protective rubber sleeve
- Continuously updating display
- Large backlit display
- 5 volt scaled ppm output
- Stainless steel rigid and flexible exhaust sample probe
- Flexible input line with "fail-safe" probe release
- In-line water trap and particle filter
- 12 volt DC supply for use in vehicle

2. Checks and Zeroing

1. Ensure the batteries are inserted as described in Section 4.4.
 2. Make sure the probe and water trap are clear of water. This should be done after each test and any water should be carefully disposed of. Clean out the water trap tube with a paper towel or allow it to air dry.
 3. Make sure the particle filter is clean and dry. Replace as required.
 4. Due to the nature of the operation of this instrument, the probe must be set up as detailed in Section 3.1. **Regular inspection of the tubing and all joints should be made to ensure that there are no leaks.**
 5. Turn on the instrument outdoors or in a well ventilated room by turning on the **POWER** switch to **ZERO & STANDBY** and allow the display to settle. This will typically take 2 minutes.
 6. Once the display has settled, turn the trim knob on the top of the analyzer until the display reads **0000+2ppm**.
- NOTE: Zeroing must be performed in fresh air. Disconnect the sample probe and remove the instrument from any toxic area.*
7. The instrument is now ready for use. Do not switch off until your tests are complete.

3. Using the SGA

3.1 Probe Connections

The probe kit consists of the following parts. Figure 1 shows the system set up for use in the vehicle.

- | | |
|-------------------------------------|---|
| 1. Rigid exhaust probe | 6. Outlet tube |
| 2. Flexible exhaust probe extension | 7. Inlet tube with 9, 7 and 8 in-line |
| 3. Fixed extension (not shown) | 8. Inlet tube from water trap to instrument |
| 4. Water trap tube | 9. Inlet tube from hose to water trap |
| 5. Particle filter | 11. Fail safe probe release |

Lay the flexible input tube and water trap either inside the car or to the point where monitoring will be done. The water trap should be held vertically with the particle filter at the bottom.

When using in the vehicle, pass the exhaust hose through the window opening.

Connect the rigid exhaust probe to the inlet tube and insert into the vehicle exhaust. Make sure the probe is firmly fixed to the tailpipe. The flexible extension can be attached to this probe if the exhaust immediately bends prior to the tailpipe outlet.

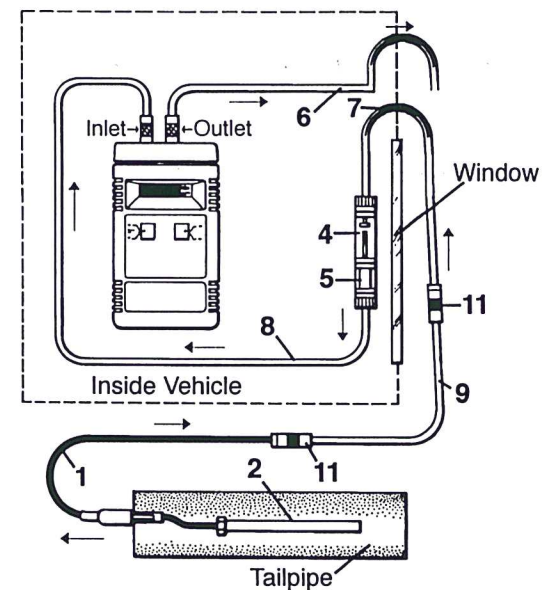


Figure One - Probe Arrangement

It is important that the probe is inserted a sufficient distance into the exhaust pipe to eliminate the risk of backflushing air, which would cause an erroneous reading.

Lay the inlet tubing so that it cannot come into contact with the hot exhaust and constantly rises from the probe up to the window hanger. This will help prevent condensation from collecting in the tube.

If necessary, attach the plastic hose to the vehicle panels using a suitable adhesive tape so that there is no risk of the hose being affected by the vehicle slipstream and creating a hazard. See safety messages.

Lay the outlet tube so that it vents into fresh air or a well ventilated area. When using the instrument in the vehicle, the tube must pass through the window opening. See safety messages.

Connect the inlet (small connector) and outlet (large connector) tubes onto the analyzer and make sure they are connected correctly.

The inlet extension probe can be used where large vehicles are to be monitored. Under no circumstance should it be used without the water trap and particle filter. Note that the response time to changes in exhaust gas concentrations will increase slightly due to the increased length of inlet tube.

Take care to ensure that all hose connections are correct and that a good seal has been made at each point. Any leaks in the hose or couplings will give reduced readings or create hazards. See safety messages.

Note:

- Do not place any of the inlet hoses in the vehicle tailpipe.
- If water is observed in the tubing or water trap, do not allow it to build up to a point where it would enter the gas inlet connector to the analyzer. Disconnect, drain and allow to dry.

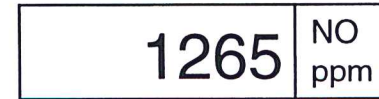
3.1 Taking Measurements

Make sure the analyzer has been correctly zeroed as in 2.0 and the **POWER** switch in on **ZERO & STANDBY**.

With the probe set up as described in the previous section, prepare the vehicle for the required test. If a recorder is to be connected to the analyzer, see Section 4.1.

Move the **POWER** switch to **ON**. This will activate the pump, allowing gas to be drawn into the analyzer and out through the outlet tube.

The display will change and a gas reading in parts per million (ppm) will be shown as indicated below:



The above display shows 1265ppm.

Do not rely on erratic, questionable or obviously erroneous test information. Misdiagnosis may lead to incorrect or improper repair and/or adjustment. Improper repair and/or adjustment may cause damage to the vehicle or equipment, or make the vehicle or equipment unsafe to operate. See safety messages.

If the reading ever exceeds 5000ppm, disconnect the tubes from the analyzer and vent in fresh air to allow the display to return to zero (± 2 ppm). If the analyzer does not zero after a few minutes, repeat Section 2.

When taking readings, always allow for the slight response delay that is unavoidable in sampling exhaust gases.

Once the required measurements or sequence of tests have been done, remove the exhaust probe from the tailpipe and vent in fresh air. Leave the analyzer **ON** to allow it to clear any gas taken during sampling. Allow the display to settle to normal.

Return the **POWER** switch to **ZERO & STANDBY** to prolong battery life.

Repeat process for subsequent tests.

Switch **POWER** to **OFF** once all measurements and tests have been taken.

Make sure that all tubes, water trap and particle filter are clear and dry prior to packing away and storing.

4. Additional Features and Information

4.1 Voltage/ppm Output

Provided on the analyzer is a voltage output for use with recording devices. It is nominally linear and is scaled as follows:

1 volt = 1000ppm or 1 ppm = 1 millivolt

Check to be sure that the signal output is compatible with your recorder. Connect leads from the recorder using 5mm banana plugs, black to -vd and red to +ve.

Zero the recorder as described in its User or Operator Manual.

4.2 Using the Backlight

The backlight can be used at any time by simply moving the **BACKLIGHT** switch to **ON**.


Note: It is advisable not to use the backlight unless necessary because it will reduce battery life considerably.

4.3 12 Volt DC Input

The analyzer can be powered from either its internal batteries, as explained in Section 4.4, or from an external supply as detailed below.

Located on the right-hand side of the case is a 12 volt DC input to power the analyzer from an external battery. The lead provided will plug into the cigarette lighter of most vehicles and power the analyzer from the vehicle's battery.

4.4 Battery Indicator and Changing Batteries

If the **LOBAT** or  symbol appears on the display (as shown below), the batteries should be replaced as soon as possible. The instrument will still function but the readings given may be inaccurate.

LOBAT	1265	NO ppm		1265	NO ppm
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To change batteries, remove the cover located on the back of the instrument by pushing it upwards with the thumb and releasing. Install four "AA" size batteries as indicated by the labels in the battery compartment. **Alkaline batteries are recommended.**

4.5 Particle Filter Replacement

The in-line particle filter in the inlet tube prevents excess dirt and water vapor from reaching the analyzer. If it appears wet or dirty, replace it with the recommended filter element.

Separate one end cap of the filter housing and remove the filter element. A new element should be placed on the spigot located on the black end cap and the original cap replaced to ensure the filter lies correctly inside the housing.

5. Suggested Operational Check List

This is for guidance only and its applicability must be reviewed in the light of local circumstances and regulations.

1. Make sure the calibration of the instrument is regularly checked. Annual calibration is recommended by an approved service center.
2. Always re-zero the instrument where you can be sure that the ambient level of gas being sampled is very low.
3. Make sure the outlet tube is positioned either outside the vehicle or in a properly ventilated area.
4. When inserting the exhaust probe into the tailpipe, make sure it is far enough in the pipe to ensure that no ambient air will flush into it. The flexible exhaust probe extension will help to ensure this will not happen.
5. Make sure the exhaust probe is firmly attached to the tailpipe and that the inlet tube is securely attached to the vehicle body.
6. Do not operate the analyzer outside its rated specifications.
7. Operation of the instrument when low battery is indicated may give false readings and be subject to errors.
8. If moisture droplets appear in the outlet tube, withdraw the inlet tube from the tailpipe and immediately disconnect it from the analyzer. Allow ambient air to be drawn through the analyzer.

6. Specifications

6.1 Bluepoint® EEEA501A NOx Analyzer

Range (ppm)	5000
Accuracy	±5% of reading
Battery Supply	4 x AA cells (alkaline preferred) or 12 volt DC external supply
Battery Life AA Cells	6 hours (continuous use without backlight)
Sensor Type	Electrochemical
Sensor Life	Typically 2 years (guaranteed one year)
Display	4 1/2 digit LCD 0.4 inch high
Zero Control	10 turn pot situated on the top of the analyzer with rotary turn knob.
Low Battery	Automatically indicated on LCD
Operating Temperature	32°F to 105°F
Operating Humidity	10 to 90% non condensing
Altitude	Indoor use up to 6000ft.
Installation Category	IP20
Pollution Degree	1
Response Time (90%)	Typically 30 to 40 seconds (analyzer)
Gas Flow Rate	Approx. 700ml/min
Gas Inlet/Outlet	Via quick fit couplings
Case Details	Ruggedized style case Three position power switch (On/Zero/Off) Two position backlight switch (On/Off) Protective rubber sleeve
Scaled Output	0-5 volts: 1 volt = 1000ppm 5mm banana plugs: Red +ve, Black -ve

6.2 Parts List

EEEE501A-1	Basic Probe
EEEE501A-2	Flexible Extension (4" length)
EEEE501A-3	Fixed Extension (4" length)
EEEE501A-4	Water Trap Assembly
EEEE501A-5	Particle Filter
EEEE501A-6	Exhaust Port, Hose (6' length)
EEEE501A-7	Water Trap to Line, Hose (1' length)
EEEE501A-8	Inst. to Water Trap Hose (4' length)
EEEE501A-9	Line Break to Probe, Hose (9' length)
EEEE501A-11	Fail Safe Probe Release
EEEE501A-12	"O" Ring Kit
EEEE501A-13	Instrument Carrying Case
EEEE501A-14	Instrument Manual
EEEE501A-15	Instrument Boot
EEEE501A-16	Instrument Only

7. Maintenance and Cleaning

The case and rubber protective boot can be cleaned using a cloth moistened with light detergent. Use a cloth moistened with clean water to remove any residues. Dry with a soft, clean cloth. Never expose the instrument to water.

The seals of the hose connectors should be very lightly lubricated using a nitrile compatible compound.



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