



Technical Support Note

Title: Troubleshooting High Oxygen Readings on a 4 or 5 Gas EGA

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37 EGA High Oxygen Troubleshooting.docx

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Overview:

The purpose of this document is to provide a method to troubleshoot a 4 or 5 Gas EGA for high oxygen readings – which indicate that the analyzer is either measuring air-diluted exhaust gas, or not measuring exhaust gas correctly.

Preparation:

Make sure the analyzer is fully assembled with the probe, filters, and sample line attached – and has been operating for at least 5 minutes from power on. Service all Zero requests normally with the probe open to the air (not in an exhaust pipe), and verify that the oxygen channel is operating correctly (no ‘Lo’ or ‘Off’ prompt after a Zero on room air). If operation seems normal – proceed with the troubleshooting method below.

EGA High Oxygen Reading Troubleshooting Method:

1. With the fully configured (probe, etc) analyzer running, recently Zeroed and sampling room air (not exhaust) – block the gas exit port at the right side of the analyzer momentarily by placing your thumb over it. You should see the oxygen reading (which will start at 20.6% or so) immediately rise due to the increase in gas pressure from the blocked port. If you see good response, you have gas flow through the analyzer – so proceed to step 2. If you do not see good response in oxygen readings – there is little or no gas flow through the analyzer. You can figure out where the blockage is by removing items from the sampling system. The 25 mm filter on the handle is a water blocking filter, so it is designed to stop gas flow if there is water in the black sample line – so start there by removing the filter and repeating the exercise. If you see good response – continue up the chain until you find the problem.
2. If the gas flow is OK – then gradually put the probe into an exhaust pipe of a running engine (it does not have to be the test vehicle – the service vehicle is probably a better thing to test – as it has a multiple cylinder smooth running engine, long exhaust system, catalytic converter, etc. We are looking for the source of the high oxygen readings – which will be very low on a catalytic converter equipped street vehicle. Look particularly at the oxygen and CO₂

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- readings as you insert the probe. They should both change in opposite directions – as O₂ is very high in room air, and very low in exhaust gas – and CO₂ is just the opposite – low in room air and high in exhaust. The strength of this transition is the degree to which you are sampling exhaust gas as the probe is inserted. If you do not see very low oxygen at the end of insertion, you have additional air getting into the probe system.
3. **NOTE:** The biggest problem with air leaks is the valve at the bottom of the water trap. To test for this, place your thumb over the bottom of the water trap to block the base, and see if the oxygen values go down and CO₂ goes up. If this happens, you can unscrew the water trap bowl and flush water through the bowl a couple of times to clean the valve – and then check it again. The valve runs better wet – so this may help. Also see TSN# 35 ‘Water Trap Valve Field Test’ for more information
 4. If inserting the probe in the tailpipe gives normal readings, but the readings go strange after a Zero with the probe in the tailpipe – it is possible that the ambient air solenoid is not operating properly in the analyzer. This solenoid switches gas input from the probe to an ambient air port on the left side of the analyzer, and if the solenoid is not working correctly, the analyzer will keep drawing in gas from the probe during the Zero process – and the analyzer will think that the probe gas is ambient air and recalibrate itself on it. This can cause the problems in readings as you have shown too – so that is why you should do the tests above first – where the analyzer is pulling room air in from the probe too.

Note that if this is the problem – the work around (until the analyzer gets fixed) is to remove the probe from the exhaust pipe and let it sample room air before you Zero it – and when the Zero is done, re-insert the probe.

If these troubleshooting methods do not locate the problem, contact Bridge Analyzers for more troubleshooting assistance, or return the analyzer for service at the location above.

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