




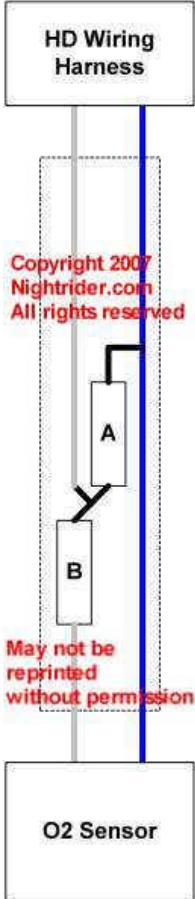
 http://nightrider.com/biketech/hd2007HD_nbo2_volt_divide.htm		SEP OCT DIC 21 2006 2007 2008	Close Help
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How to Richen a Narrow Band O2 Sensor

A narrow band O2 sensor (NBO2) essentially only understands a 14.7:1 air fuel ratio (AFR). Here is a little trick that can be used that will richen the AFR to approximately 14.2:1. While this is still not an ideal AFR for idle and cruising, it is an improvement. These can be built for a very low cost with a few parts from Radio Shack or any other electronics parts supply.

 <p>Copyright 2007 Nightrider.com All rights reserved</p> <p>May not be reprinted without permission</p>	<h3>Building the NBO2 Richen circuit</h3> <p>In the Harley-Davidson O2 sensor wiring harness, the Blue wire is the (+) or sensor signal wire. The Gray wire is the (-) or ground wire. excess voltage into the gray wire. This also keeps the divider circuit very small. It should be built as an "inline" circuit.</p> <p>The A resistor is 20Kohm, the B is 10Kohm making a 2/3 voltage divider.</p> <p>The "package" should be put together with barrel crimp connectors on the O2 sensor side. After putting it together, it should be placed in heat shrink tubing to form a vibration resistant, weather tight package. The pigtails can be butt jointed or used with quick disconnects. Adding a wire sleeve around the package after installing it on the wiring harness makes it a very neat, nearly invisible package.</p> <p>There will be some detailed pictures of this upgrade in the future.</p>
	<h3>Special Notes on the HD NBO2 sensor</h3> <p>You should never solder a O2 sensor wire because the sensor "will breathe" through the cable. The acceptable method of splicing or repairing O2 wiring is with crimp connectors. This information was from Bosch Technical Staff in Europe. Here is the technical description of why you do not solder the connections on the O2 sensor side of the updated wiring.</p> <p>The outside of the bulb is exposed to the hot gases in the exhaust while the inside of the bulb is vented internally through the sensor body to the outside atmosphere. Older style oxygen sensors actually have a small hole in the body shell so air can enter the sensor, but newer style O2 sensors "breathe" through their wire connectors insulation and have no vent hole.</p> <p>It's hard to believe, but the tiny amount of space between the insulation/wire and through wire insulation provides enough air to seep into the sensor (for this reason, grease should never be used on O2 sensor leads/connectors because it can block the flow of air). Venting the sensor through the wires rather than with a hole in the body reduces the risk of dirt or water contamination that could foul the sensor from the inside and cause it to eventually fail.</p>

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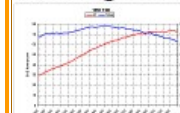
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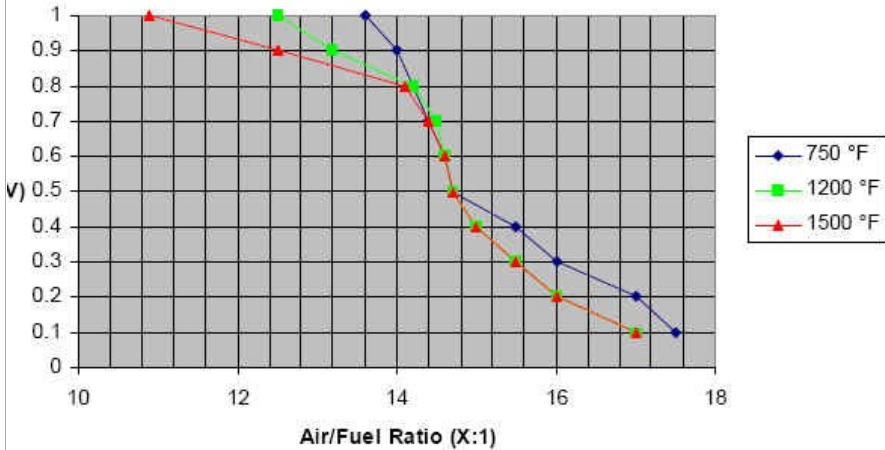
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Voltage Output from a typical narrow band O2 sensor

The accurate range for narrow band O2 sensors is the .400v to .800v or the 15.0:1 to 14.2:1 AFR ranges. Once the fuel ratio is outside these limits, the accuracy of measurement rapidly changes. This is why narrow band oxygen sensor are considered a 14.7:1 AFR voltage switch.

The voltage divider works by taking advantage of the accurate range of the O2 sensor and some simple electronics to allow .750v output from the O2 sensor to look like .500v to the fuel injections system.



Air/Fuel Ratio (X:1)	750 °F (V)	1200 °F (V)	1500 °F (V)
11.0	1.00	1.00	1.00
12.5	1.00	1.00	0.90
13.5	1.00	0.90	0.80
14.0	0.90	0.80	0.70
14.5	0.70	0.60	0.50
15.0	0.50	0.40	0.30
16.0	0.30	0.20	0.10
17.0	0.10	0.00	0.00

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183 HP, 2 carbs, 2680cc

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