Edelbrock 8 Channel Wide Band O2 Kit
Catalog # 91177
INSTALLATION INSTRUCTIONS

- **PLEASE** study these instructions carefully before installing your new Edelbrock 8 Channel Wide Band O2 Kit. If you have any questions, do not hesitate to contact our **Technical Hotline at: 1-800-416-8628,** from 7am-5pm, Monday through Friday, Pacific Standard Time, or via e-mail at: **QD2@Edelbrock.com.**

CAUTION: CAREFULLY READ INSTRUCTIONS BEFORE PROCEEDING

OVERVIEW
The Edelbrock 8 Channel Wide Band O2 Kit is a complete package intended for individual cylinder air/fuel ratio (AFR) monitoring of V8 race engines. Four dual channel O2 Amplifier units are connected to an existing data acquisition or EFI system.

MOUNTING
Two Dual Channel O2 Amplifier units are required for each cylinder bank. The individual units can be secured by means of two #8 screws through the mounting flanges. Mount the units as far away as possible from the ignition system. Use nylon tie wraps to secure the wire harness near the units.

WIRING HOOKUP
If your race vehicle uses any type of CD (capacitive discharge) ignition such as the MSD 6, 7, or 8 series, you must properly ground and filter the ignition unit. Unless your ignition unit is directly connected to the battery terminals, you must install a filter capacitor such as MSD P/N 8830 or the 12000 uF 25 volt part described in the next paragraph. Visit www.msdignition.com, download the MSD 8 installation instructions, and refer to Figure 1 on the MSD instructions as a guide for installing the filter capacitor and grounding the ignition system.

Do not ground your O2 Amplifier units or data acquisition system to the same ground point used for the ignition system.

CAUTION: The output of the O2 Amplifier is a low level 0-5 volt analog signal. Noise from an improperly grounded and filtered race ignition system will cause data acquisition errors.

Edelbrock O2 Amplifier units use a switching power supply that draws a peak current near 6 amps. When multiple units share the same power and ground connections, a filter capacitor is required. Refer to Figure 2. For a V8 application with two banks of dual O2 Amplifier units, use filter capacitor for each bank. Two 12,000 uF 25 volt filter capacitors and mounting brackets are included in this kit. For each bank, connect the two O2 Amplifier red and heavy black wires to the filter capacitor using the supplied #10 ring tongue terminals. Connect the capacitor + terminal to switched power using minimum 18 AWG wire. Connect the capacitor - terminal to a good chassis ground location using minimum 16 AWG wire. Connect the O2 Amplifier thin black wires to the same point that the data acquisition system is grounded. Keep all power and ground connections as short as possible. The Edelbrock 8 Channel Wide Band O2 Kit is supplied with oxygen sensor extension cables. One end of the cable is not terminated. Loose Deutsch connector parts are supplied to allow cutting the extension cables to the required length for a custom installation. Plan the installation carefully. To avoid electrical noise problems, route the cables along frame rails or other metal chassis parts and at least one foot away from any spark plug wires or ignition coil connections. You will require a proper Deutsch crimping tool such as P/N DTT-16-00 available from Ladd Industries (phone: 1-800-223-1236). Follow the color chart below:

Figure 1

Pin Location	Wire color
1	Red
2	Black
3	Brown
4	White
5	Green
6	Seal

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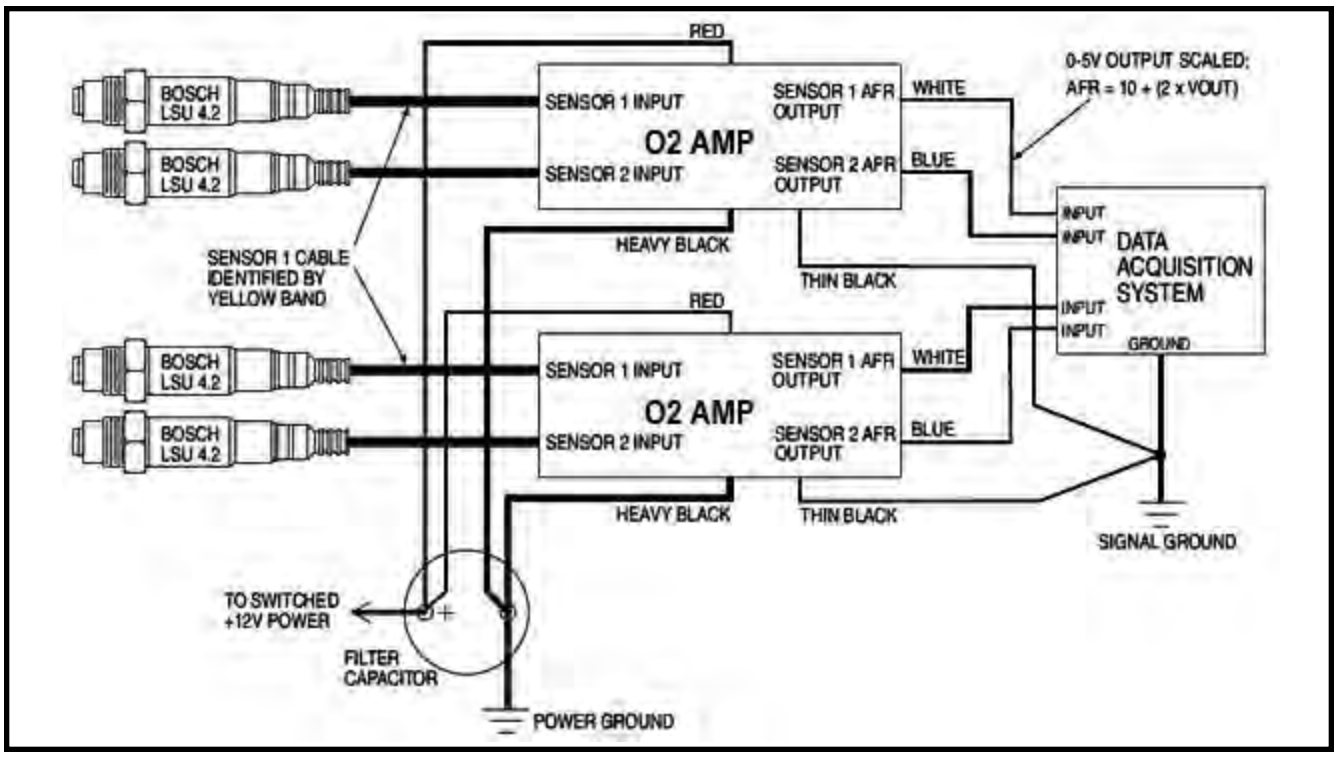
Figure 2 - Typical Hookup for Mutiple O2 Amplifier Systems



SENSOR INSTALLATION

The Bosch LSU 4.2 sensors should be located on the header pipes about 6-8 inches from the head flange. Ideally the sensor tip should face down to avoid accumulation of condensation. When choosing a mounting location, allow several inches clearance for the sensor wire harness. The wire harness must exit straight out from the sensor. Do not loop the harness back onto the sensor body. 18 x 1.5 mm weld nuts must be welded onto the header pipes.

After welding, run an 18 x 1.5 mm tap through the threads. Failure to clean the threads may result in sensor damage. Do not install the sensors until after the free air calibration procedure described in the these instructions. Always use an anti-seize lubricant such as Permatex 133A on the sensor threads.

DATA ACQUISITION

The 0-5 volt analog outputs (white and blue wires) from the O2 Amplifiers are compatible with most data acquisition and Fuel Injection systems that have available analog inputs. After free air calibration, accuracy of the Edelbrock Air Fuel Monitor system is +- 0.1 AFR over the 10.3-19.5 AFR range. The 0-5 volt analog outputs are scaled:

AFR = 10 + (2 x Vout) or
Vout = (AFR – 10)/2

For example, an output of 2.5 volts corresponds to 15.0 AFR. Note that when power is first turned on and the sensors are not yet at their normal operating temperature, the analog outputs are held at less than 0.20 volts. During free air calibration and while the O2 Amplifier status LEDs are rapidly blinking, the analog outputs will be near 5.0 volts.

V Out to AFR		
Gas AFR	10.00	20.00
(VOLTS)	0.00	5.00

CALIBRATION INFORMATION

Below are the Gasoline Calibration Values for Edelbrock QwikData 2 and QwikData data systems.

QwikData 2	
Bits	**Value**
0	10.00
4095	20.00

QwikData		
Gas AFR	10.00	20.00
(VOLTS)	0.00	5.00

Edelbrock Pro Flo Lambda Calibration.

Pos	Bits	Lambda
1	0.000	**0.680**
2	68.00	**0.725**
3	136.0	**0.770**
4	204.0	**0.815**
5	272.0	**0.860**
6	340.0	**0.905**
7	408.0	**0.950**
8	476.0	**0.995**
9	544.0	**1.045**
10	612.0	**1.090**
11	680.0	**1.135**
12	748.0	**1.180**
13	816.0	**1.225**
14	884.0	**1.270**
15	952.0	**1.315**
16	1020.0	**1.360**

OPERATION AND CALIBRATION

The O2 Amplifier has red status LEDs for each channel. When power is turned on, the LEDs blink at a slow rate until the corresponding sensor has reached normal operating temperature.

After installation, the O2 Amplifier system requires free air calibration. This should be done with the sensors dangling in free air. The environment must be free of hydrocarbon vapors. We suggest that you perform the free air calibration outdoors. Turn the free air calibration trimpots on the O2 Amplifier full counterclockwise. Turn on power and wait for 60 seconds so the system can fully stabilize. Then slowly turn each free air calibration trimpot clockwise until the corresponding LED starts flashing at a rapid rate. Try to set each trimpot at the point where its LED just starts to flash. The free air calibration procedure should be performed at reasonable intervals (every 250-500 hours) or whenever a sensor is replaced. If you cannot get an LED to rapidly flash when its trimpot is turned full clockwise, you either have a damaged sensor or very high hydrocarbon levels in your environment. If both LEDs keep blinking at the slow rate, you may have a low battery voltage condition. Try connecting a battery charger. The Edelbrock O2 Amplifier uses standard Bosch LSU 4.2 sensors used on a VW production application (Bosch P/N 0 258 007 057/058 or VW P/N 021 906 262B). The proprietary VW connector is replaced with a smaller Deutsch DT-04-6P available from Ladd Industries. Edelbrock offers replacement sensors(part#91171) with the Deutsch connector installed. If you plan to terminate your own sensors, see Figure 1 from page 1 of these instructions for pin designations.

EXHAUST CONSIDERATIONS

The Edelbrock O2 system may give inaccurate results in certain situations:

Excessive exhaust back pressure. Wide-band sensors are affected by back pressure. Excessive back pressure causes exaggerated AFR indications under rich and lean conditions, but has little effect at 14.7 AFR (stoichiometric). Race vehicle exhaust systems are free flowing and problems with exhaust back pressure are not likely.

Exhaust reversion. Reversion is the term for a negative pressure wave that can suck ambient air back into the exhaust and cause an erroneous lean AFR indication. Open "drag pipes" usually suffer from reversion effects and may not be suitable for use with the WEGO IIID except at or near wide open throttle. Reversion effects will be most noticeable at idle, part throttle low RPM, and decel.

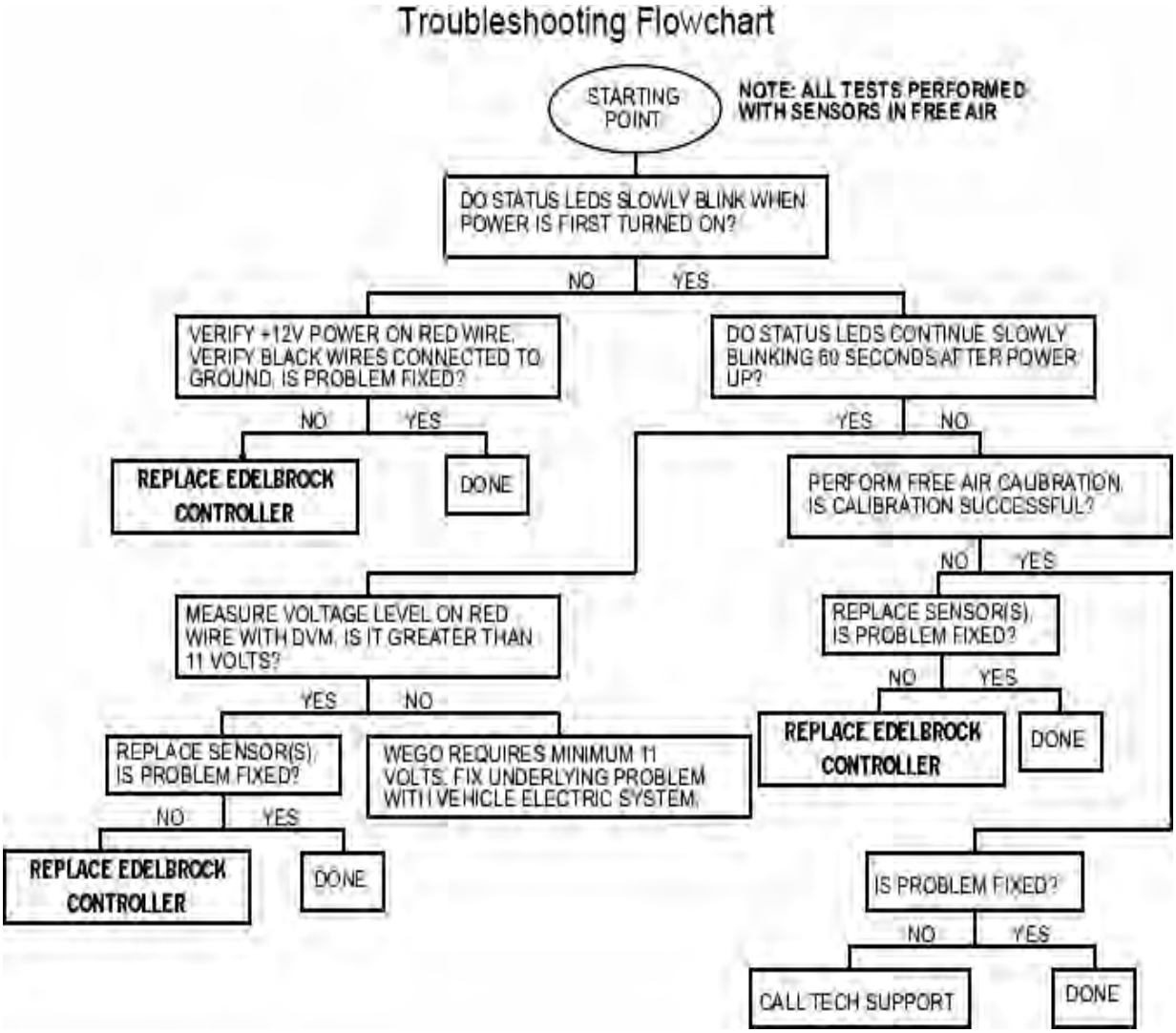
Excessive scavenging. Tuned exhausts in combination with a high overlap camshaft profile can pull unburned air and fuel mixture through the cylinder into the exhaust and cause an erroneous rich AFR indication. The same effect can occur with high boost turbo/supercharger applications.

Misfiring. If the AFR is so rich that the engine misfires, high levels of oxygen will remain in the exhaust gas and result in an erroneous lean indication.

ENGINE TUNING GUIDELINES

Higher AFR values correspond to a leaner (less fuel) condition. The practical operating range for most engines using gasoline fuel is from approximately 11.5 to 14.7 AFR. Combustion of a stoichiometric mixture (exactly enough air to burn all the fuel) results in 14.7 AFR indication. Automotive engines with catalytic converters operate near 14.7 AFR during cruise and idle. Race engines usually require a richer mixture to limit cylinder head temperature and prevent detonation. The table below lists reasonable AFR values for race engines without emission controls.

Operating Mode	Recommended AFR
Cold start (first 30 sec.)	11.5-12.5
Idle	12.8 - 13.5
Part Throttle Cruise	13.0 - 14.0
Wide Open Throttle	12.5 - 12.8 (values down to 11.5 may be used to reduce detonation)



Edelbrock LLC, 2700 California Street, Torrance, CA 90503
Tech Line: 800-416-8628; Office: 310-781-2222

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