This document is intended to help in the understanding of OBDII parameters, known as 'PIDs', and give them definition. It is intended to be only a basic, not a technical guide to scantool data. These PIDS are used by the OBDII system and by scantools that interact with the systems for diagnostics and system interrogation. PID stands for Parameter Identification, and in practice is rather cryptic. The scantool, luckily, takes this cryptic, bit and byte data shorthand and translates it for us, so it is more understandable.

Live Data Trigger Frame
PID Unit Frame

These are parameters specific to the scantool being used in this case, and are not OBDII standard PIDs.

Fuel System 1 Status [Status 1 or Fuelsys1]
Fuel System 2 Status [Status 2 or Fuelsys2]

Returns either OL – for Open Loop, or CL – for Closed Loop
Tells whether fueling is currently based on O2 Sensors and the oxygen content of the exhaust, [Closed Loop] or based on sensor inputs [Open Loop] due to conditions; logged faults, cold engine or wide open throttle, for instance.

Calculated Load Value [CLV or Load_PCT]

Engine load is represented by a "Calculated load value" which refers to an indication of the current airflow divided by peak airflow, where peak airflow is corrected for altitude, if available. This definition provides a unitless number that is not engine specific, and provides the system with an indication of the percent engine capacity that is being used. (With wide open throttle as 100%).

Engine Coolant Temp [ECT]

Current engine coolant temp as measured by the ECT [Engine Coolant Temp sensor]. Usually reported in Celsius degrees.

Short Term Fuel Trim-Bank 1 [STFT 1 or SHRTFT1]
Short Term Fuel Trim-Bank 2 [STFT 2 or SHRTFT2]

Immediate trim changes made to the fuel mapping in response to oxygen changes in the exhaust. Base fueling [injection] map is contained in the ECM, if changes are required, fuel is added or subtracted from the base. Shown in percent, positive percentage is ADDING fuel, negative percentage is SUBTRACTING fuel. Short term trims are lost at key off.

Long Term Fuel Trim- Bank 1 [LTFT 1 or LONGFT1]
Long Term Fuel Trim- Bank 2 [LTFT 2 or LONGFT2]

Long term changes made to the fuel mapping based on Short Term fueling corrections. Example: Short Term remaining at plus 6% for an extended period; Long Term Trim will increment by that percentage and Short Term will return to zero. Long Term Trims are maintained in non-volatile memory at key off, and therefore not lost.

Engine RPM [RPM]

I think this one is self explanatory.

Vehicle Speed Sensor [VSS]

Returns current vehicle speed, usually shown in kph, but some scantools allow selecting kilometers or miles per hour.

Ignition Timing Advance #1 [Sparkadv]

Shows current spark timing advance in degrees for cylinder #1. Most engines with knock retard systems can retard timing for individual cylinders, however.

Intake Air Temp [IAT]

Returns current temperature of the air entering the induction system. Like ECT, usually reported in degrees Celsius, but some tools allow selecting scale.

Air Flow Rate from Mass Air Flow Sensor [MAF]

Returns the ECM calculation of total air flow, based on MAF signal AND air temperature [IAT]. Most systems list this in grams per second, g/sec.

Absolute Throttle Position [TP or ABS_TP]

Listed in percent, shows actual position of the throttle butterfly, as it is not directly connected to any cable or other driver input.

Bank 1 -- Sensor 2 Volts [O2S12]
Bank 2 – Sensor 2 Volts [O2S22]

Voltage output of downstream [second] Exhaust Oxygen sensor. Varies between .2v and .8v normally. Used mainly for monitoring exhaust catalyst function.

Bank 1 – Sensor 2 % [O2S12STFT]
Bank 2 – Sensor 2 % [O2S22STFT]

Returns an additional trim value to the ECM for extremely fine fueling corrections. Not used except for later model years, 2006 and later. Generally not useful to the novice.

OBD Requirements OBD and OBD2 [OBDSUP]

Returns information to define which OBD requirements the vehicle was designed to meet; i.e. which OBD system is onboard.

01h : OBD II (California ARB)
02h : OBD (Federal EPA)
03h : OBD and OBD II
04h : OBD I
05h : not intended to meet any requirements
06h : EOBD (Europe)
07h : EOBD and OBD II
08h : EOBD and OBD
09h : EOBD, OBD and OBD II
0Ah : JOBD
0Bh : JOBD and OBD
0Ch : JOBD and EOBD
0Dh : JOBD, EOBD, and OBD II
0Eh-FFh : Reserved by SAE J1979

Now, upstream Oxygen Sensors are a little more confusing. Earlier cars use upstream units that are very similar to the downstream sensors, called zirconium dioxide sensors. They are also referred to as 'Heated Exhaust Gas Oxygen' sensors, or HEGO sensors. Their output signal is voltage just like the downstream; it swings from .2v to .8v about 15-18 times a minute normally. These were fitted to the AJ26 V8 and the first generation S-Type, both V6 and V8.
Beginning with the AJ27 4.0L V8 in 1999 and the AJ33 4.2L V8 in 2003, the upstream oxygen sensors operated differently. These are referred to as 'wideband' or 'linear' sensors. To add confusion, they are also called 'Universal' Heated Exhaust Gas Oxygen sensors, or UHEGO. The signal PID for these sensors is CURRENT, in milliamps or microamps as the case may be.

***Note: The six-cylinder AJ16 engines utilize a different, Titanium Dioxide Oxygen Sensor at all four positions, this is a very delicate five volt sensor that is beyond the scope of this paper.

- ✓ **Conventional [HEGO] Oxygen Sensors**

Bank 1 – Sensor 1 [O2S11]
Bank 2 – Sensor 1 [O2S21]

Voltage output of upstream [first] Exhaust Oxygen sensor. Varies between .2v and .8v normally. Used mainly for fueling control, air/fuel ratio and emissions monitoring.

- ✓ **Universal [UHEGO] Oxygen Sensors**

Bank 1 – Sensor 1 [WO2S11]
Bank 2 – Sensor 1 [WO2S21]

ECM monitors the current, positive or negative, needed to drive the operation of the sensor in response to the exhaust oxygen content, and reports that value. Positive amps indicate a lean system and negative indicate a rich system.

Bank 1 – Sensor 1 Equivalence Ratio
Bank 2 – Sensor 1 Equivalence Ratio

This PID is of limited value to technicians, and has even less value to the novice. This value is the commanded fuel to oxidizer ratio that the ECM wants to achieve. In essence 'Equivalence Ratio' is the reciprocal of the air/fuel ratio.