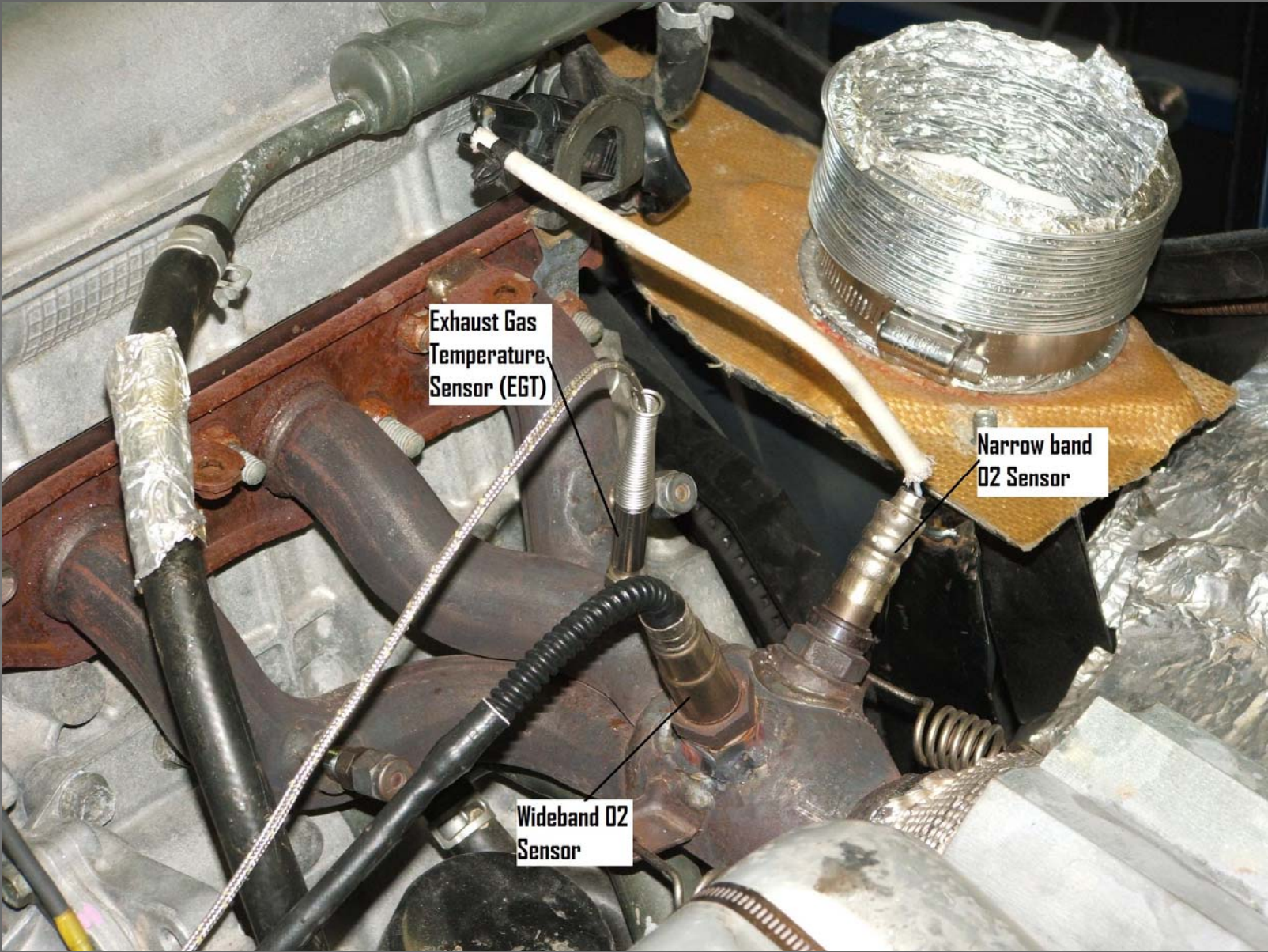


# CSC Piggyback



# Milestones

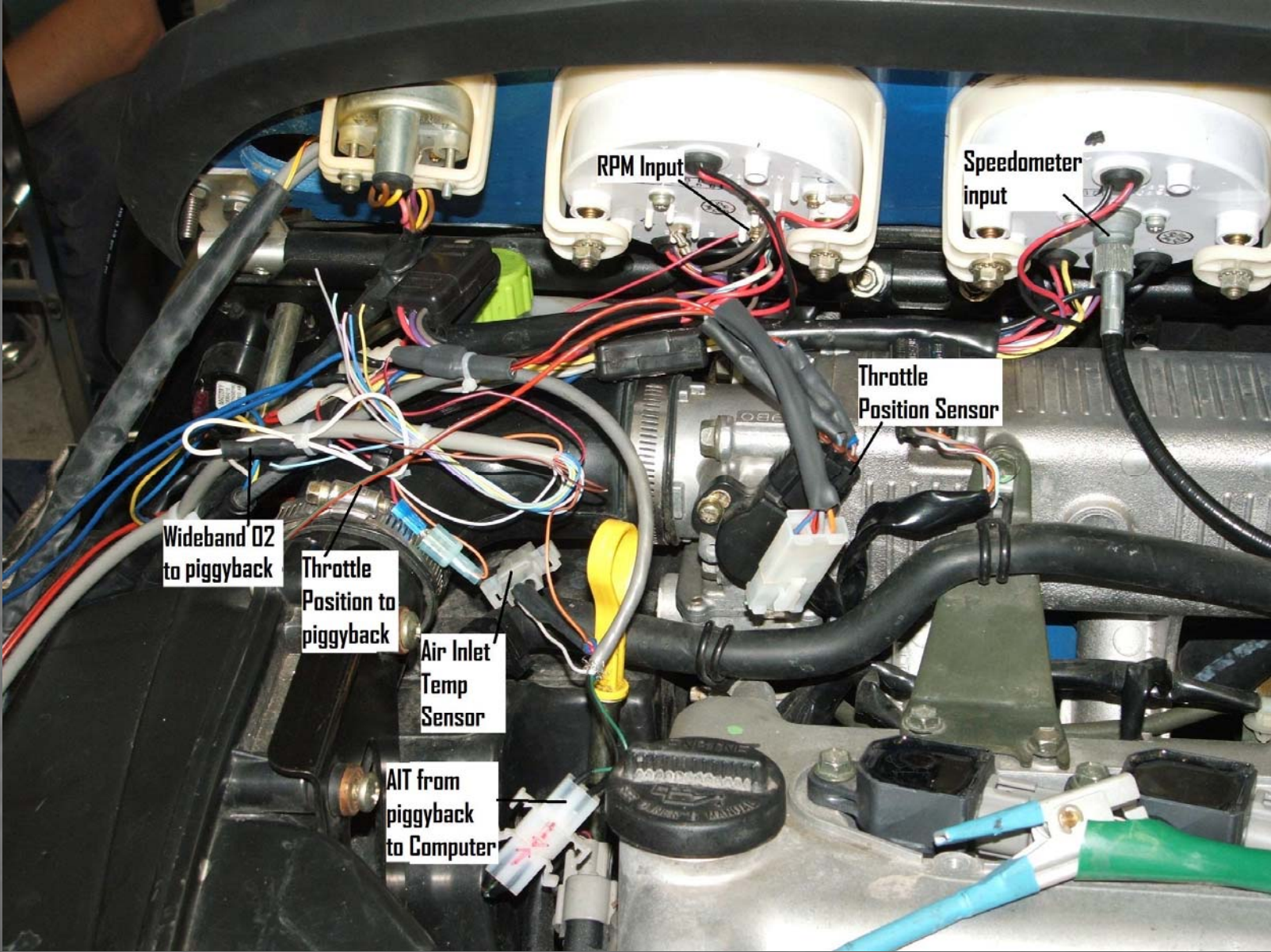
- Attach Datalogger to sled (10/18)
- Written test plans & control parameters (10/25)
- First layout of basic stamp (11/1)
- Complete all sled inputs (12/1)
- Operational piggyback on bench with dummy inputs (12/6)
- Reconstruct last year's test results (12/6)



**Exhaust Gas  
Temperature  
Sensor (EGT)**

**Narrow band  
O2 Sensor**

**Wideband O2  
Sensor**



RPM Input

Speedometer input

Throttle Position Sensor

Wideband O2 to piggyback

Throttle Position to piggyback

Air Inlet Temp Sensor

AIT from piggyback to Computer

# R-500 Datalogger



LEVEL 1  
EXT Sensors



AFR 14.6  
EGT 023° C  
BST 14.7



LEVEL 2  
Data Logger

AFR 0.00 MAP 0.00  
TPS 0.00 aIT 0.00  
MPH 0.00 RPM 0.00

An1 0.00V An3 0.00V  
An2 0.00V An4 0.00V  
S-1 000Hz S-2 000Hz

Data Log  
Status ■ Session 00  
Time elapsed 0h00m00s  
Max  100°C  
+EXIT +0 +8 +11

LEVEL 3  
Real-time  
Dyno

PWR 410 HP  
TO 230 ft-lb  
G 0.23



G Sensor Setup  
Accel (<x-axis>) G-AD  
+Corner (<y-axis>) G-AD  
++ SELECT ++ CHANGE

G Sensor Trim Setup  
X offset + 0.00  
Y offset - 0.00  
X +0.00 Y -0.00  
++ SELECT ++EXIT

Vehicle Speed Setup  
S1 Freq : 0000 Hz  
x Adjust : 0.0220  
Speed : 0 mph  
++ SELECT ++ CHANGE

Engine Speed Setup  
S2 Freq : 0000 Hz  
x Adjust : 30.00  
RPM : 0000  
++ SELECT ++EXIT

Vehicle Weight Setup  
Weight : 3000  
Unit : lbs.  
++ SELECT ++EXIT

Dyno Setup  
Power = HP  
Torque = ft-lbs  
Drivetrain Loss 25%  
++ SELECT ++EXIT

Upload to PC  
Select Session NA  
Status Ready  
B%  
++EXIT + SELECT ++EXIT

Press + to Erase  
All Logged Data  
EXIT

Warning LED Setup  
2 variables  
AFR < 14.7  
AI > 1.20 U  
++ SELECT ++EXIT

Fuel Select  
Lambda +Gasoline  
Diesel Methanol  
Ethanol LPG CNG  
++ SELECT ++EXIT

EGT Temp Setup  
Temp = Celsius  
++ SELECT ++EXIT

LEVEL 4  
User Setup

Signal Routing  
A1 = A1 A3 = EGT  
+ A2 = A2 A4 = AFR  
++ SELECT ++ CHANGE

Knock Setup  
Knock = Rev  
RPM Max = 0100 Hz  
RPM on S1  
++ SELECT ++EXIT



Default Menu Setup  
1-1  
Ext Sensor Gauges  
++ SELECT ++EXIT



Aux Input Setup  
Vac-Boost  
+Vac-Boost Sensor AI  
Default ON 3-Bar  
++ SELECT ++ CHANGE

Datalog Input Setup  
Channel = A1  
Label = AN1  
Customize Values +  
++ SELECT ++EXIT

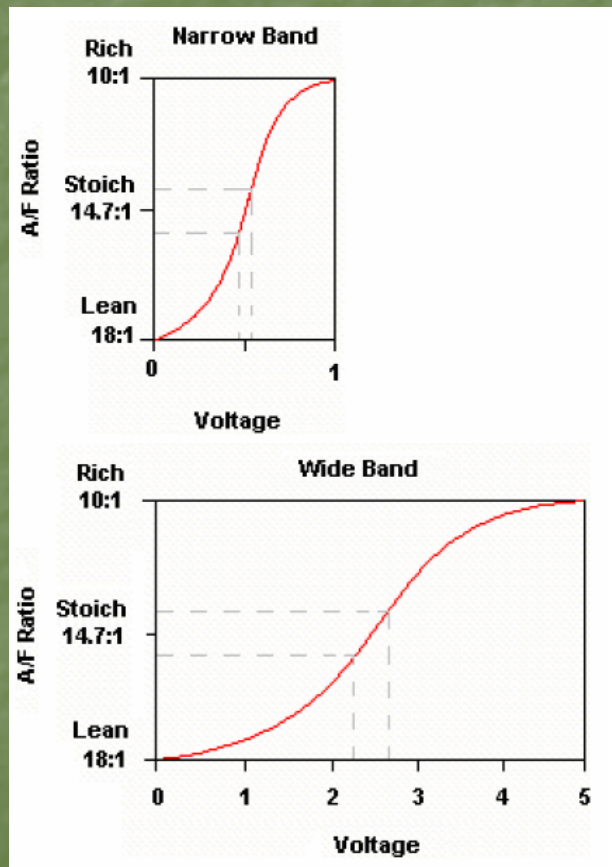
Press + To Restore  
System Defaults  
EXIT

Test Flash Memory  
All Logged Data  
Will Be Lost  
Press + To Proceed  
EXIT

# Piggyback and Datalogger Inputs

- **AIT** - Controls the A/F ratio to increase causing the emissions to decrease.
- **O2 Sensor** - Reads what the A/F ratio is.
- **Throttle position** - To determine the needed A/F ratio at idle conditions.
- **EGT** - Safe guard to make sure the catalytic converter doesn't over heat.
- **RPM** - Reference in the Datalogger to graph real-time data.
- **Speed** - Reference in the Datalogger to graph real-time data.

# O2 Sensors



- The wideband O2 sensor has a range from 0-5V, while the stock sensor only has a range from 0-1V. This gives us a greater range, which we can manipulate the A/F ratio.

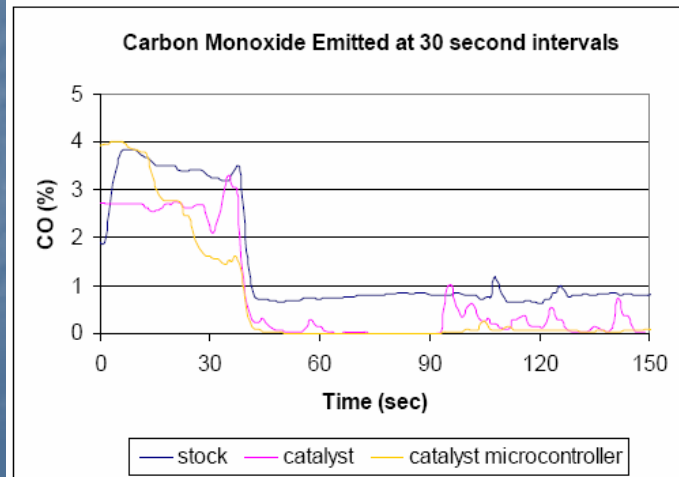
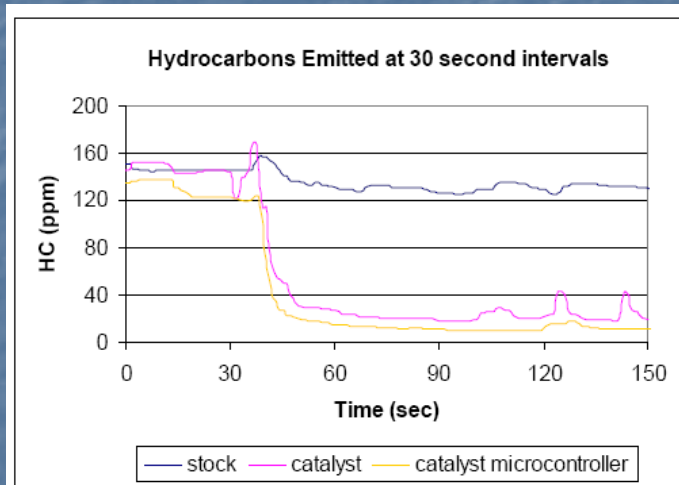
# Speedometer Input



# Test Parameters

- 0-30 seconds sled held at idle
- 30-60 seconds sled held at 3000 RPM
- 60-90 seconds sled held at 4000 RPM
- 90-120 seconds sled held at 5000 RPM
- 120-150 seconds sled held at 6000 RPM

# Engine Map



- The need for the engine mapping is for us to know what happens with the engine at different engine speeds. At idle we have a hard time controlling the emissions of HC and CO.

# Engine Map

- From the previous years group the next step is to understand the throttle position of the sled while it is at idle.
- If we understand what the voltage of the sled is at idle we can program the engine to richen the fuel or lessen the fuel to burn more HC and CO.

# Next Semester Milestones

- Final construction of new piggyback with tested program.
- Machine piece for speedometer digital converter.
- Test new piggyback against last years emission results.
- Complete new box for piggyback and mounting on dash for the Datalogger.