Notes:

Jumpers labeled JP5 and JP6 are crossover wires,nothing more. This was done to ease single sided PCB Prototype testing.

J2 is the TE Connectivity Automotive Grade water resistant connector. The 35 positions will allow for modifications to the board for additional inputs/outputs as this design only uses 27 positions. My samples to test have arrived, http://www.te.com Part #'s:

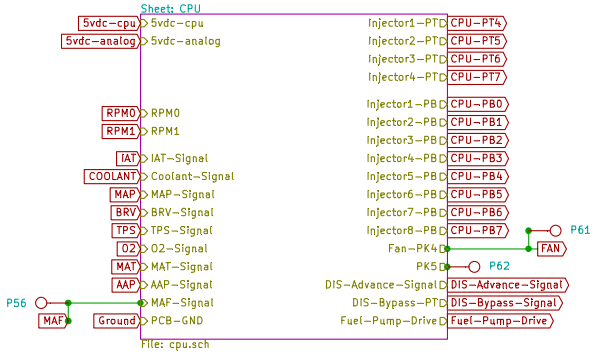
1-776163-2 Right Angle 35 Position Header (Natural Color)
OR
1-776231-2 Vertical 35 Position Header (Natural Color)
1-776231-2 Vertical 35 Position Header (Natural Color)
776164-2 35 Position AMP SEAL Plug Assembly (Natural Color)

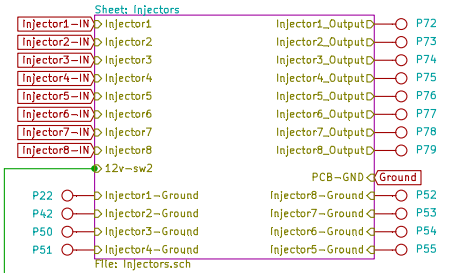
Make sure that the PCB grounds do not touch the inside of the case and isolate the TO-220 voltage regulators from the end panels of the case with mica insulators and use plastic screws.

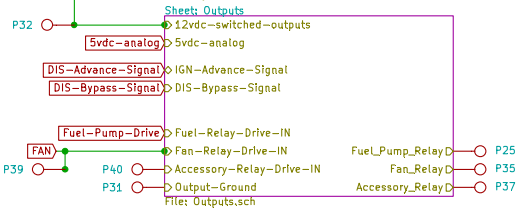
5vdc-cpu = VDD

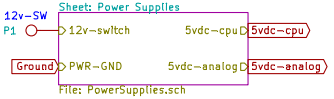
5vdc-analog = VCC

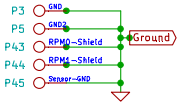
INJ-GND and INJ-GND2 are isolated to only be used by the Injector FETs









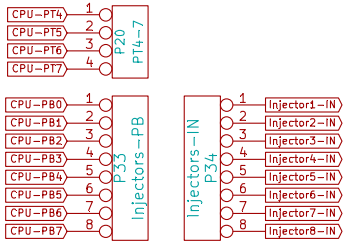


For 6/8 cylinder using Port T with current code, run jumper wires from:
P20 pin 1 to P34 pin 1 = Bank 1
P20 pin 2 to P34 pin 3 = Bank 2
P20 pin 3 to P34 pin 5 = Bank 3
P20 pin 4 to P34 pin 7 = Bank 4

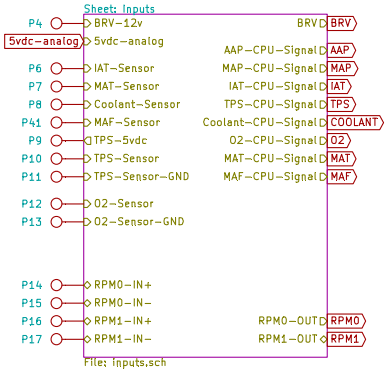
AND DO THE FOLLOWING

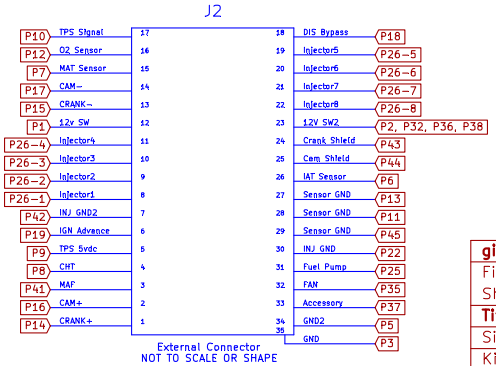
For 6/8 cylinder using Port T with current code jumper from: (can be tie-bar shorting jumper if you installed a 0.100" pin header for P34)
P34 pin 1 to P34 pin 2
P34 pin 3 to P34 pin 4
P34 pin 5 to P34 pin 6
P34 pin 7 to P34 pin 8

To use Port B with future XGATE code, run jumper wires from: P33 to P34 pin for pin and do not connect anything to P20. ie:
P33 pin 1 to P34 pin 1
P33 pin 2 to P34 pin 2
P33 pin 3 to P34 pin 3
P33 pin 4 to P34 pin 4
P33 pin 5 to P34 pin 5
P33 pin 6 to P34 pin 6
P33 pin 7 to P34 pin 7
P33 pin 8 to P34 pin 8



P20 and P34 allow for selection to use either Port T (4 cpu outputs MAXIMUM:current code) or Port B (8 cpu outputs:future XGATE code)





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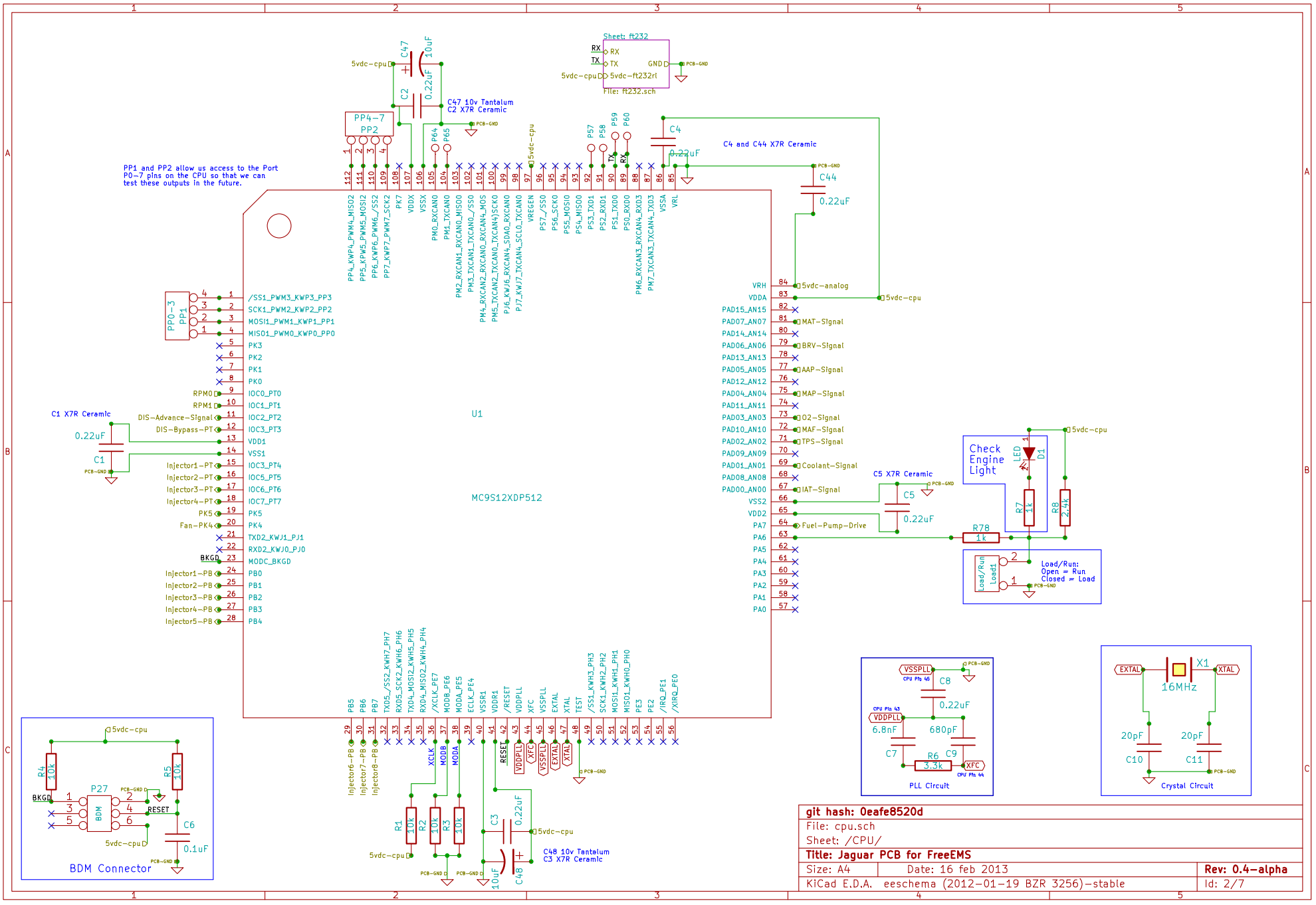
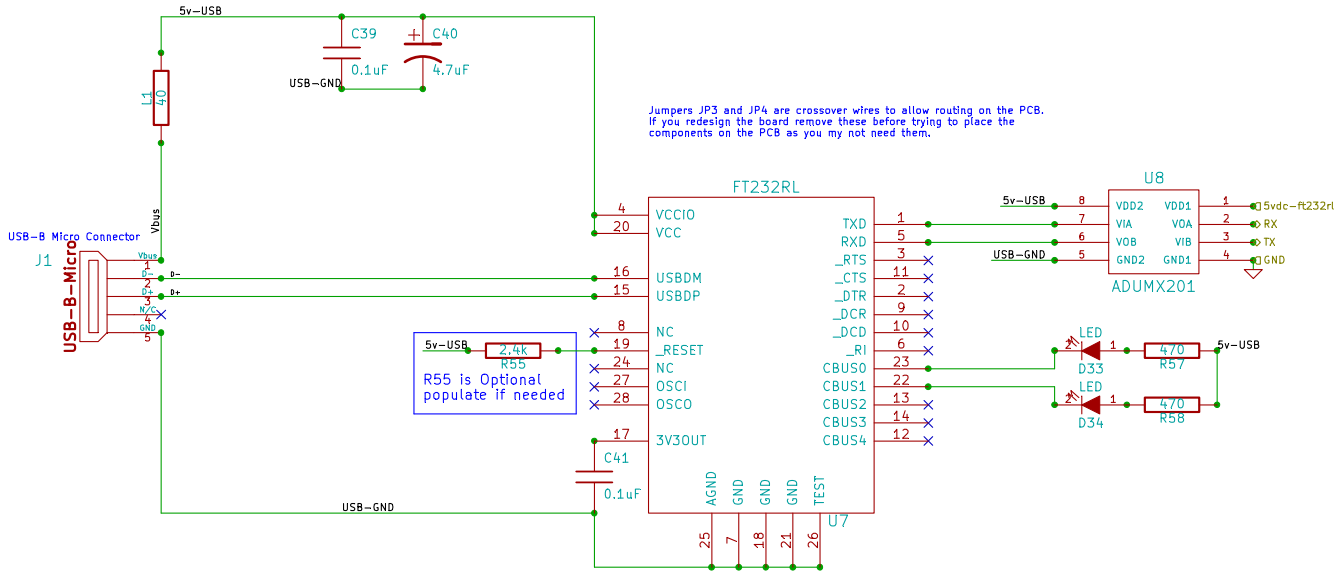
Title: Jaguar PCB for FreeEMS		
Size: A4	Date: 16 feb 2013	**Rev: 0.4-alpha**
KiCad E.D.A.	eeschema (2012-01-19 BZR 3256)-stable	Id: 1/7


Sheet: ft232
File: ft232.sch
PP1 and PP2 allow us access to the Port P0-7 pins on the CPU so that we can test these outputs in the future.
C47 10v Tantalum
C2 X7R Ceramic
C4 and C44 X7R Ceramic
C1 X7R Ceramic
C5 X7R Ceramic
C48 10v Tantalum
C3 X7R Ceramic
U1
MC9S12XDP512
Check Engine Light
Load/Run: Open = Run Closed = Load
BDM Connector
PLL Circuit
Crystal Circuit
16MHz
git hash: 0eafe8520d
File: cpu.sch
Sheet: /CPU/
Title: Jaguar PCB for FreeEMS
Size: A4
Date: 16 feb 2013
Rev: 0.4-alpha
KiCad E.D.A. eeschema (2012-01-19 BZR 3256)-stable
Id: 2/7



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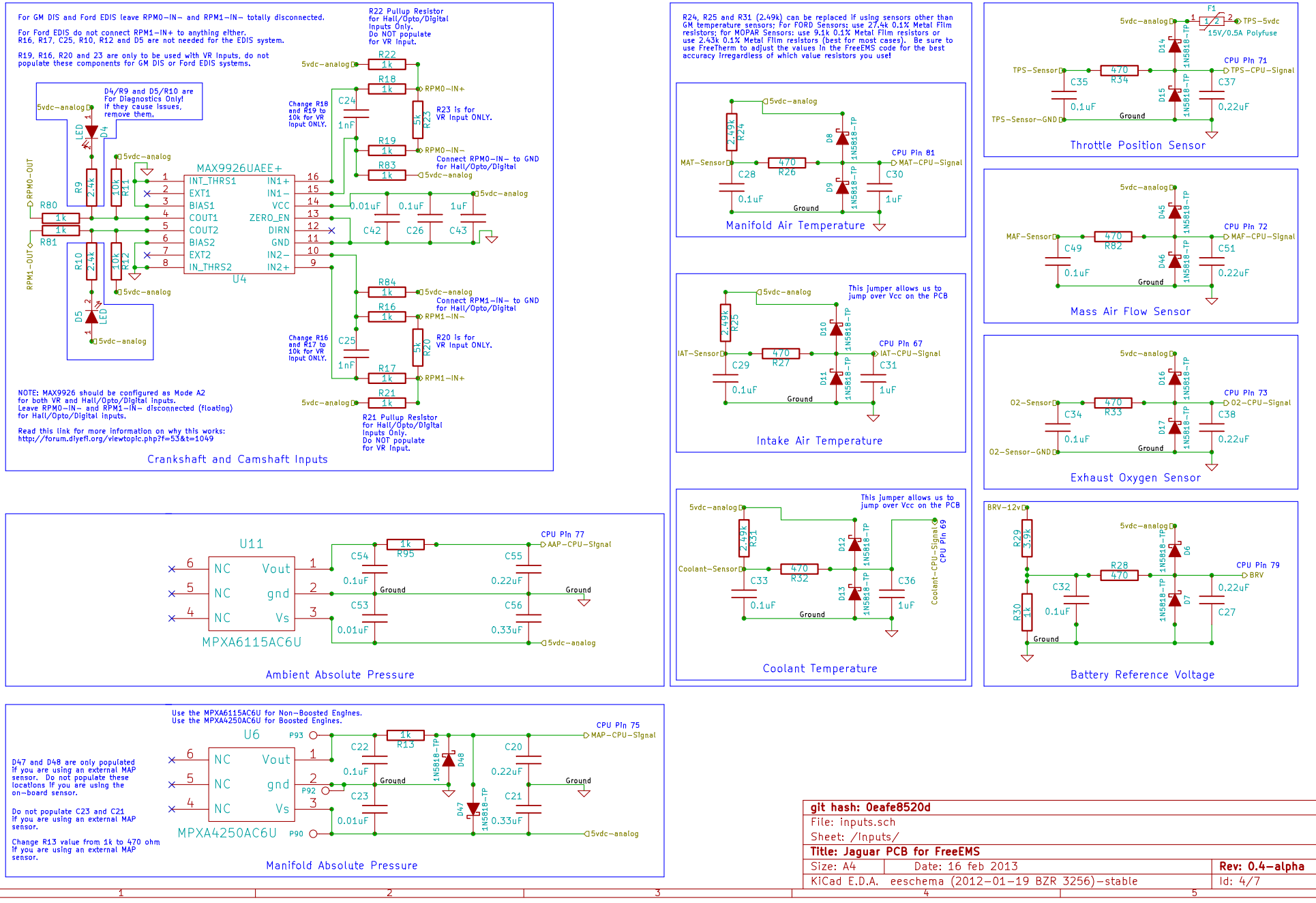
Size: A4	Date: 16 feb 2013	**Rev: 0.4-alpha**
KiCad E.D.A. eeschema (2012-01-19 BZR 3256)-stable		Id: 3/7


For GM DIS and Ford EDIS leave RPM0-IN- and RPM1-IN- totally disconnected.
For Ford EDIS do not connect RPM1-IN+ to anything either.
R16, R17, C25, R10, R12 and D5 are not needed for the EDIS system.
R19, R16, R20 and 23 are only to be used with VR inputs, do not populate these components for GM DIS or Ford EDIS systems.
D4/R9 and D5/R10 are For Diagnostics Only! If they cause issues, remove them.
R22 Pullup Resistor for Hall/Opto/Digital Inputs Only. Do NOT populate for VR Input.
Change R18 and R19 to 10k for VR Input ONLY.
R23 is for VR Input ONLY.
Connect RPM0-IN- to GND for Hall/Opto/Digital
Change R16 and R17 to 10k for VR Input ONLY.
R20 is for VR Input ONLY.
Connect RPM1-IN- to GND for Hall/Opto/Digital
R21 Pullup Resistor for Hall/Opto/Digital Inputs Only. Do NOT populate for VR Input.
MAX9926UAEE+
NOTE: MAX9926 should be configured as Mode A2 for both VR and Hall/Opto/Digital inputs. Leave RPM0-IN- and RPM1-IN- disconnected (floating) for Hall/Opto/Digital inputs.
Read this link for more information on why this works: http://forum.diyefi.org/viewtopic.php?f=53&t=1049
Crankshaft and Camshaft Inputs
R24, R25 and R31 (2.49k) can be replaced if using sensors other than GM temperature sensors; For FORD Sensors: use 27.4k 0.1% Metal Film resistors; for MOPAR Sensors: use 9.1k 0.1% Metal Film resistors or use 2.43k 0.1% Metal Film resistors (best for most cases). Be sure to use FreeTherm to adjust the values in the FreeEMS code for the best accuracy irregardless of which value resistors you use!
Manifold Air Temperature
Intake Air Temperature
This jumper allows us to jump over Vcc on the PCB
Coolant Temperature
Throttle Position Sensor
Mass Air Flow Sensor
Exhaust Oxygen Sensor
Battery Reference Voltage
MPXA6115AC6U
Ambient Absolute Pressure
Use the MPXA6115AC6U for Non-Boosted Engines.
Use the MPXA4250AC6U for Boosted Engines.
D47 and D48 are only populated if you are using an external MAP sensor. Do not populate these locations if you are using the on-board sensor.
Do not populate C23 and C21 if you are using an external MAP sensor.
Change R13 value from 1k to 470 ohm if you are using an external MAP sensor.
MPXA4250AC6U
Manifold Absolute Pressure
git hash: 0eafe8520d
File: inputs.sch
Sheet: /Inputs/
Title: Jaguar PCB for FreeEMS
Size: A4
Date: 16 feb 2013
Rev: 0.4-alpha
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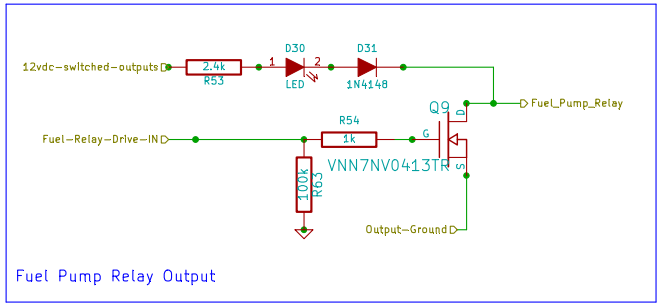
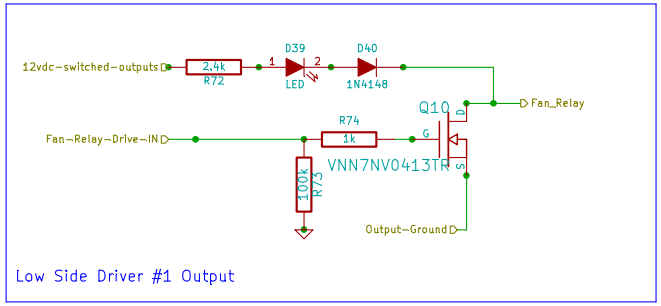
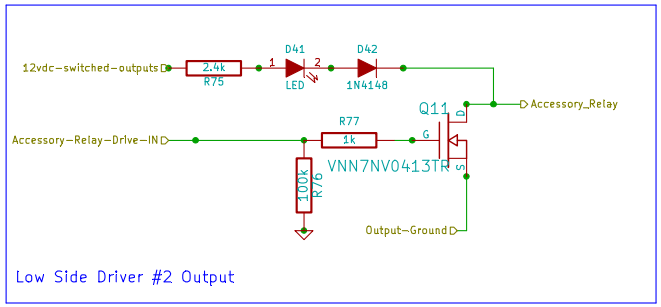
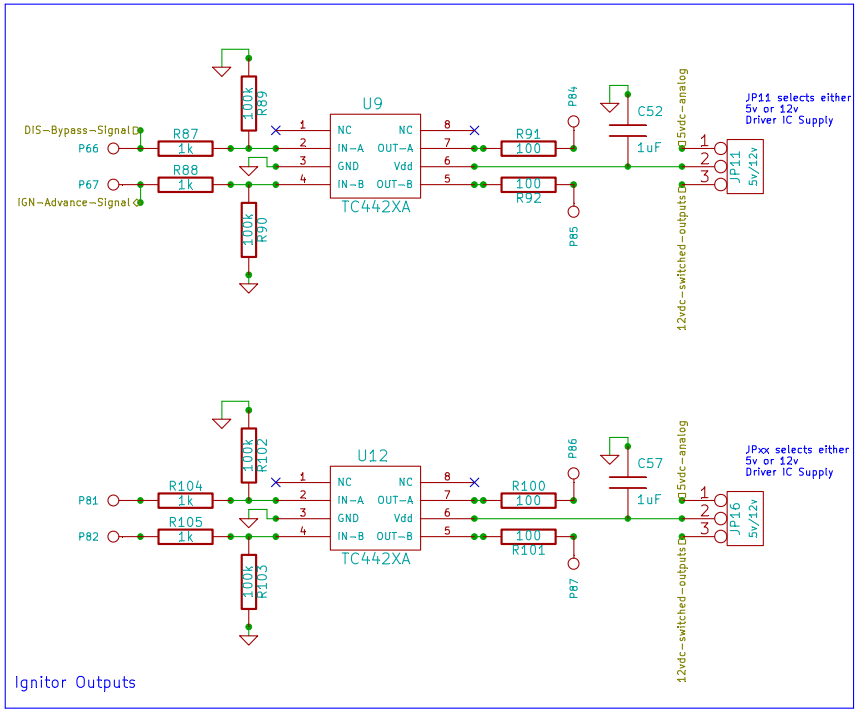
Id: 4/7









git hash: 0eafe8520d		
File: Outputs.sch		
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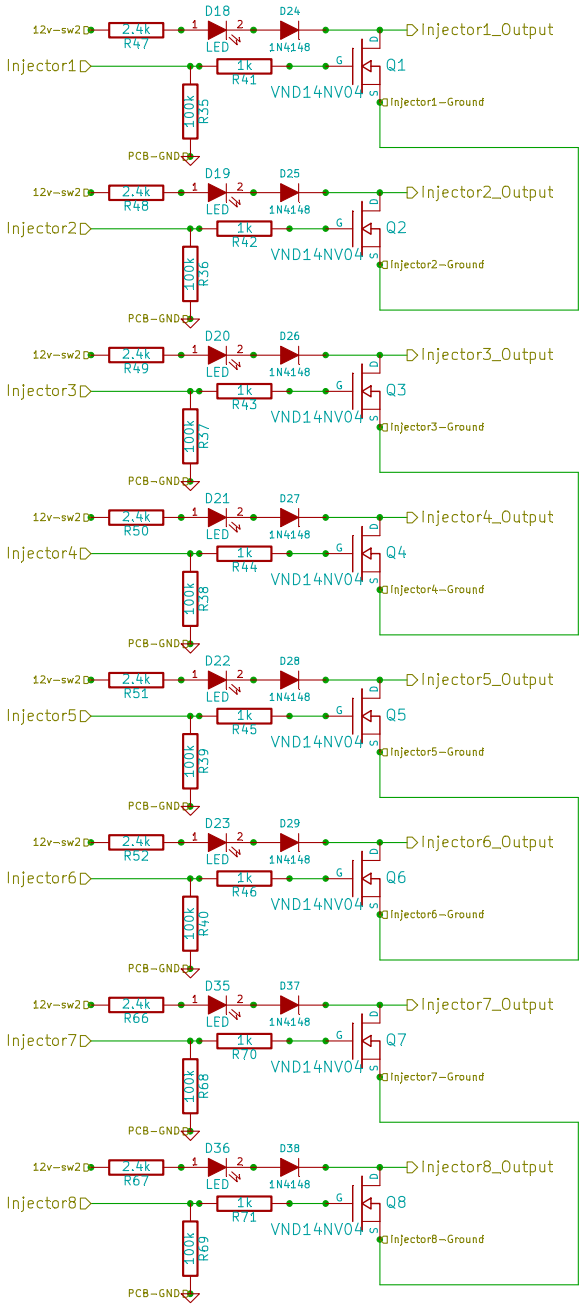
Title: Jaguar PCB for FreeEMS		
Size: A4	Date: 16 feb 2013	**Rev: 0.4-alpha**
KiCad E.D.A. eeschema (2012-01-19 BZR 3256)-stable		Id: 5/7



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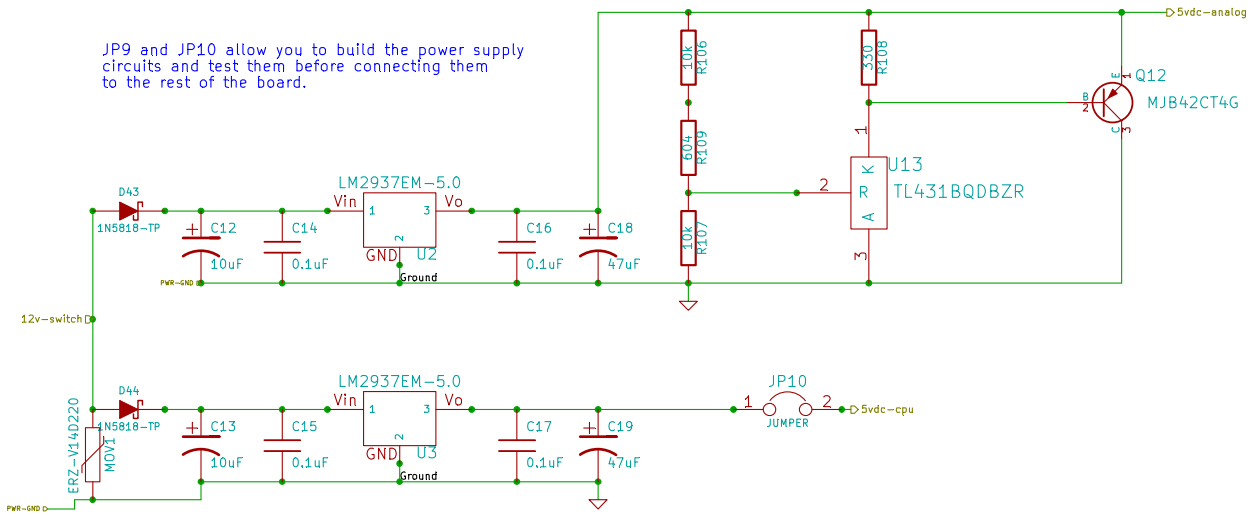
File: Injectors.sch		
Sheet: /Injectors/		
Title: Jaguar PCB for FreeEMS		
Size: A4	Date: 16 feb 2013	**Rev: 0.4-alpha**
KiCad E.D.A. eeschema (2012-01-19 BZR 3256)-stable		Id: 6/7



C14, C15, C16 and C17 are 50v X7R Ceramic capacitors.

C12 and C13 are 35v Tantalum capacitors.
C18 and C19 are 10v Tantalum capacitors.

git hash: 0eafe8520d		
File: PowerSupplies.sch		
Sheet: /Power Supplies/		
Title: Jaguar PCB for FreeEMS		
Size: A4	Date: 16 feb 2013	**Rev: 0.4-alpha**
KiCad E.D.A. eeschema (2012-01-19 BZR 3256)-stable		Id: 7/7