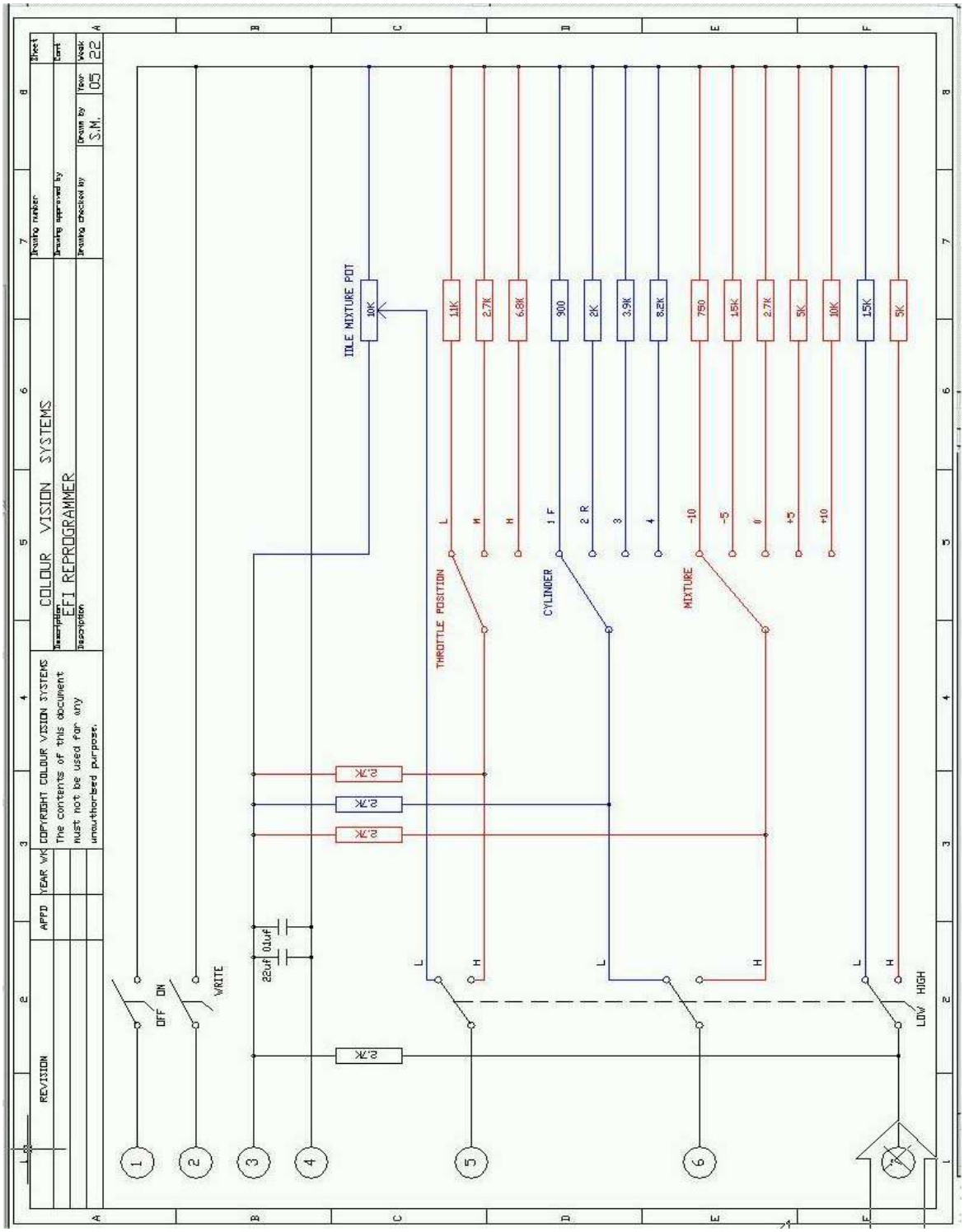
1. Read me First

Before you start soldering the PCB, make sure you've carefully read the following :

- Check the pics to get familiar with the PCB layout.
- Start with the wire jumpers. Locate them and solder them in place
- Next are all the resistors
- Now all the rotary switches
- Put all the toggle switches in place but don't solder them for now. Put the front plate in place and fasten the the toggles to the front plate. Push the front plate against the rotary switches. Now solder the toggles.
- All the rotaries and the pot do 'sit on the PCB'. There is no need to mount the rotaries and the pot to the front plate. The front plate is held in place by the 3 toggles.
- Make sure the **RED** marker on the rotary switches (pin 1) matches the red marker on the PCB
- Make sure the **WRITE** toggle switch is in the correct position and properly oriented.
- Solder the LED and the 2 caps. Note the polarity! The LED's current limiting resistor is 2K4 ohms. The wiring diagram from TLP does not show the LED and resistor.
- Don't forget to adjust the rotaries to the correct number of positions (Cylinder = 4, Throttle = 3, Mixture = 5). First turn the switch fully CCW. Now unscrew the nut, remove the lock washer and set the locking ring to the desired position. Now put the lock washer and nut back in place.
- Connect the wires to the PCB (see ***'Connector Setup Procedure'*** for the colors).
- Carefully insert the blade pins into YOUR connector housing. Make sure the 'locking tongue' on the pin is in the correct position. Now carefully 'work' the pins into the 'locked' position. This needs some effort due to those tiny 'winglets' to the sides of the pins. I found the best way to do this is by using some pointed pliers and pull the pins in a somewhat wiggly motion into the final position. Take you time, in the end it'll work and the pins are properly seated.
- ***Before connecting the box to your bike the first time, double-check the PCB for cold/poor solder joints, shorts and other possible problems/failures.***
- ***Use doc 'Box Voltage Check List' and check your voltages***

Note : The Wiring Diagram shows 5K0 ohms resistors for PIN 7 HIGH (R 17) and Mixture Switch pos. +5. (R 12) This kit contains 4K99 ohms resistors instead.

2. Wiring Diagram



Wiring diagram (schematic) as published on TLP.
Note that the power LED and it's current limiting resistor (2k4) is not shown here.

3. Parts List

Resistors (metal film, 0,25W)

Reichelt Order Numbers (www.reichelt.de)

1x	750	METALL 750
1x	1K1	METALL 1,1K
2x	1K5	METALL 1,5K
2x	1K8	METALL 1,8K
1x	2K0	METALL 2,0K
1x	2K4	METALL 2,4K
6x	2K7	METALL 2,7K
1x	3K9	METALL 3,9K
2x	4K99	METALL 4,99K
1x	6K8	METALL 6,8K
1x	8K2	METALL 8,2K
1x	10K	METALL 10K
1x	potentiometer, 10K lin	P6M-LIN 10K

Caps

1x	100nF, ceramic	KERKO 100N
1x	22uF/16V, radial	RAD 22/16

Switches

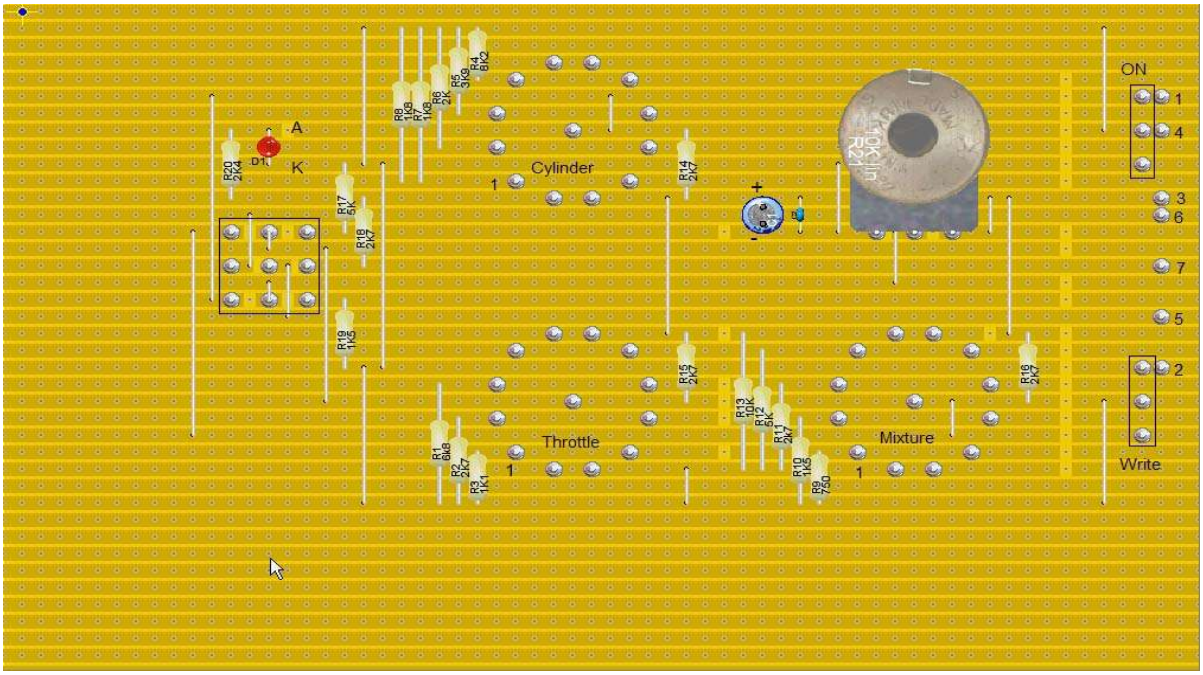
1x	Toggle switch 1-pole ON-ON	MS 500A
1x	Toggle switch 1-pole ON-(ON)	MS 500B
1x	Toggle switch 3-pole ON-ON	MS 500M
3x	Rotary switch	DS 1PC

Miscellaneous

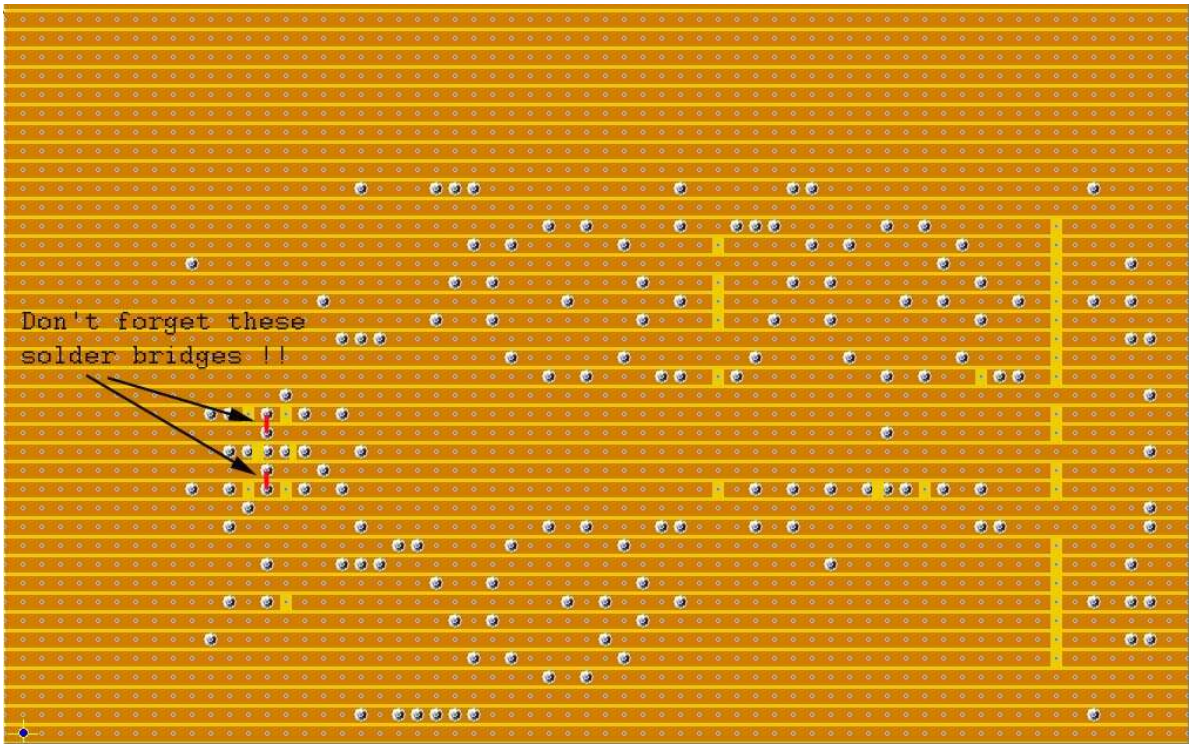
1x	LED 20mA, RED	LED 3MM 2MA RT
1x	PCB (experimental)	H25SR150
7x	Blade pin, brass	raided from ***Louis*** kit ***Order Nr. 10003843***
1x	cable, 10 wires, 1m	LIYY 1014-5
4x	Knob for rotaries, pot	KNOPF 20M-6 SW
4x	Pointer for Knob	ZEIGER 20-1 SW
4x	Cap for Knob	DECKEL 20M RT
3x	Cover for toggles	PK RT
1x	Box, housing	TEKO 362
1x	Silver wire 0,6mm	SILBER 0,6
1x	Silver wire 0,8mm	SILBER 0,8

Shrink tubing, cable tie, rubber bushing etc.

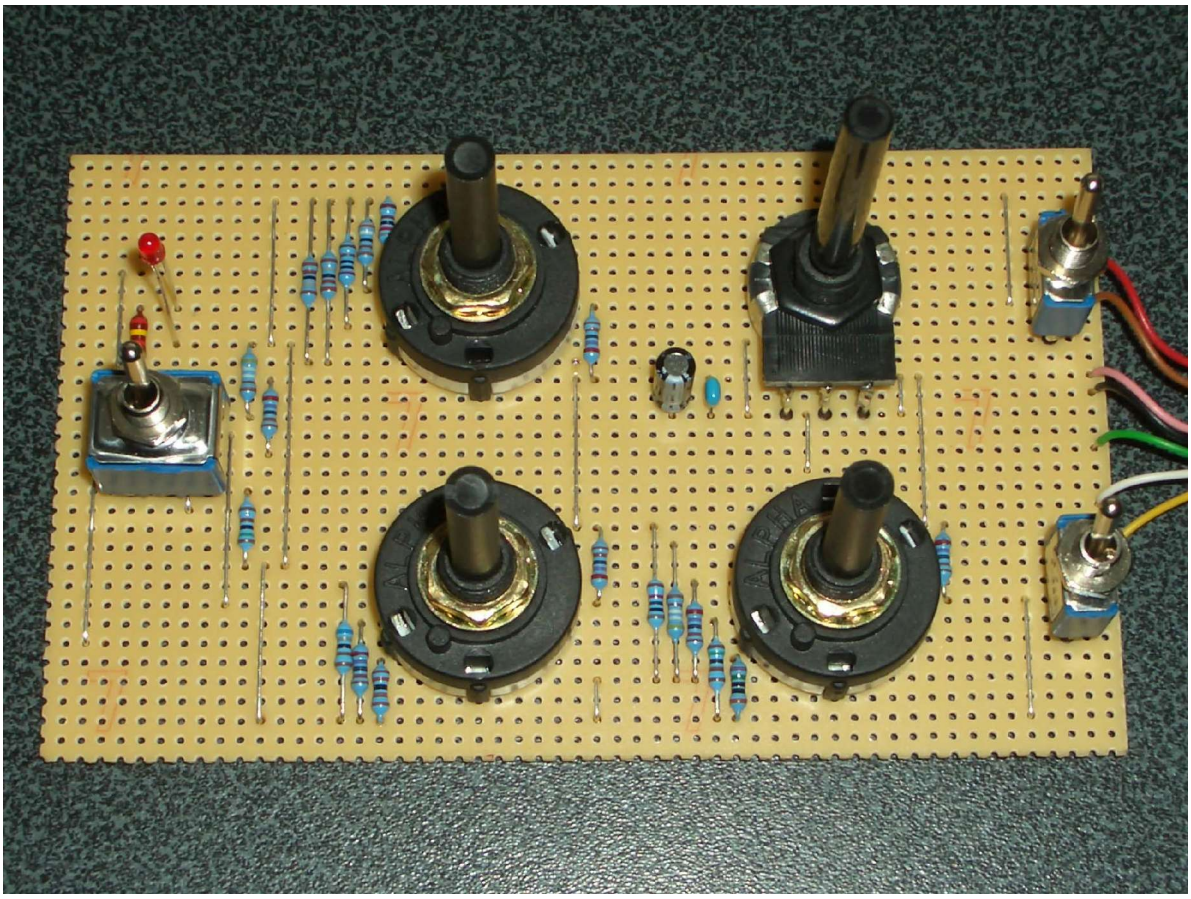
4. Printed Circuit Board



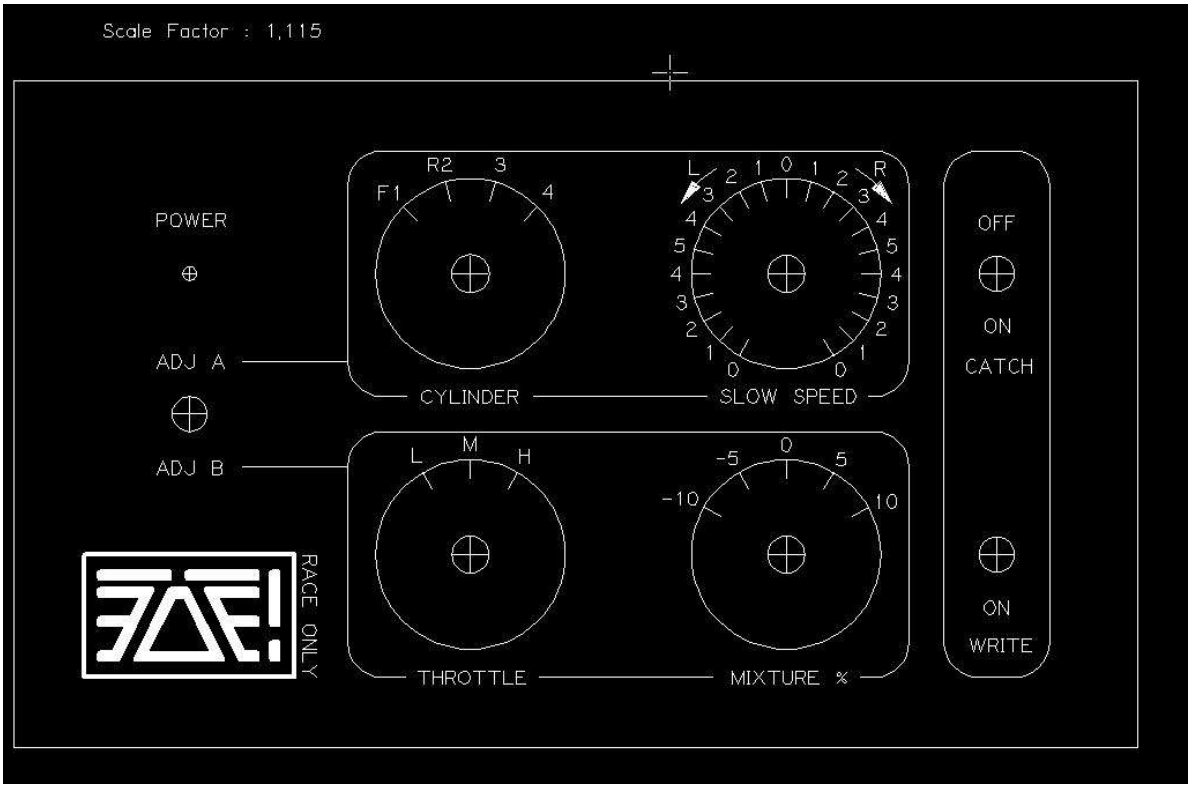
PCB, component side



PCB, solder side



This is what your PCB should look like now... (at least it should look pretty similar)



The front plate layout

5. Voltage Check List

Before you connect your JoE-Box to your bike's ECU, you might check the box for proper voltages on the connector. What you need is :

- Adjustable DC Voltage power supply or 5VDC fixed Voltage power supply
- Digital Voltmeter (set to 10/20VDC range or VDC auto-range)

The following voltages are ***calculated nominal*** values. As the box-kit contains high-quality, low-tolerance metal-film resistors only, your readings should be pretty close to these nominal values (usually within a range of +- 0,1V). If you notice any greater differences you better check that circuit in question for any problems (wrong resistor, short circuit, poor/cold solder joint etc.).

Apply +5VDC to Pin 3 (pink) and GND to Pin 4 (brown). The box's Power-LED should be ON now.

A/B Switch

Connect voltmeter to Pins 7 (green) and 4 (brown).

- Position ADJ. A 1,786V
- Position ADJ. B 3,244V

THROTTLE Switch

Connect voltmeter to Pins 5 (white) and 4 (brown). Set the A/B switch to '**B**'

- Position 'L' 1,447V
- Position 'M' 2,5V
- Position 'H' 3,579V

CYLINDER Switch

Connect voltmeter to Pins 6 (black) and 4 (brown). Set the A/B switch to '**A**'

- Position 'F1' 1,25V
- Position 'F2' 2,128V
- Position '3' 2,955V
- Position '4' 3,761V

MIXTURE Switch

Connect voltmeter to Pins 6 (black) and 4 (brown). Set the A/B switch to '**B**'

- Position '-10' 1,087V
- Position '-5' 1,786V
- Position '0' 2,5V
- Position '5' 3,244V
- Position '10' 3,937V

SLOW SPEED Pot

Connect voltmeter to Pins 5 (white) and 4 (brown). Set the A/B switch to '**A**'

- Position CCW 0V
- Position 0 2,5V
- Position CW 5,0V

CATCH Switch

Connect voltmeter to Pins 1 (red) and 4 (brown).

- Position OFF arbitrary (some mV)
- Position ON 0V

WRITE Switch

Connect voltmeter to Pins 2 (yellow) and 4 (brown).

- Position OFF arbitrary (some mV)
- Position ON 0V

6. Connector Setup Procedure

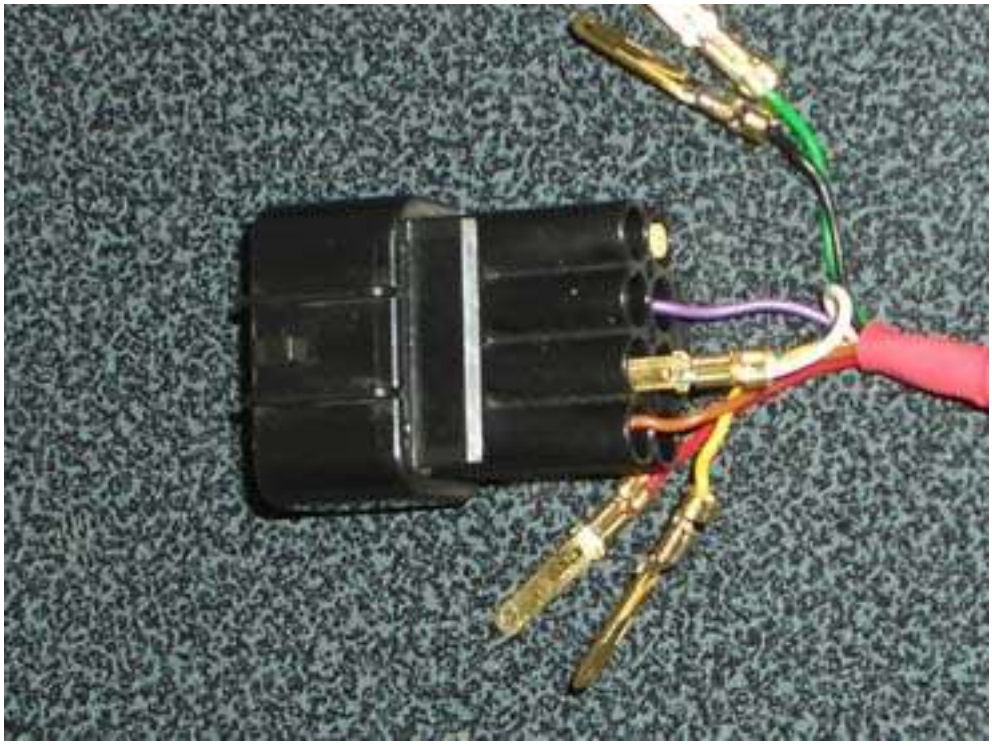
This is what your bike's connector (normally) looks like with the cap (housing) plugged.

Now remove the housing from the connector…

… like this.

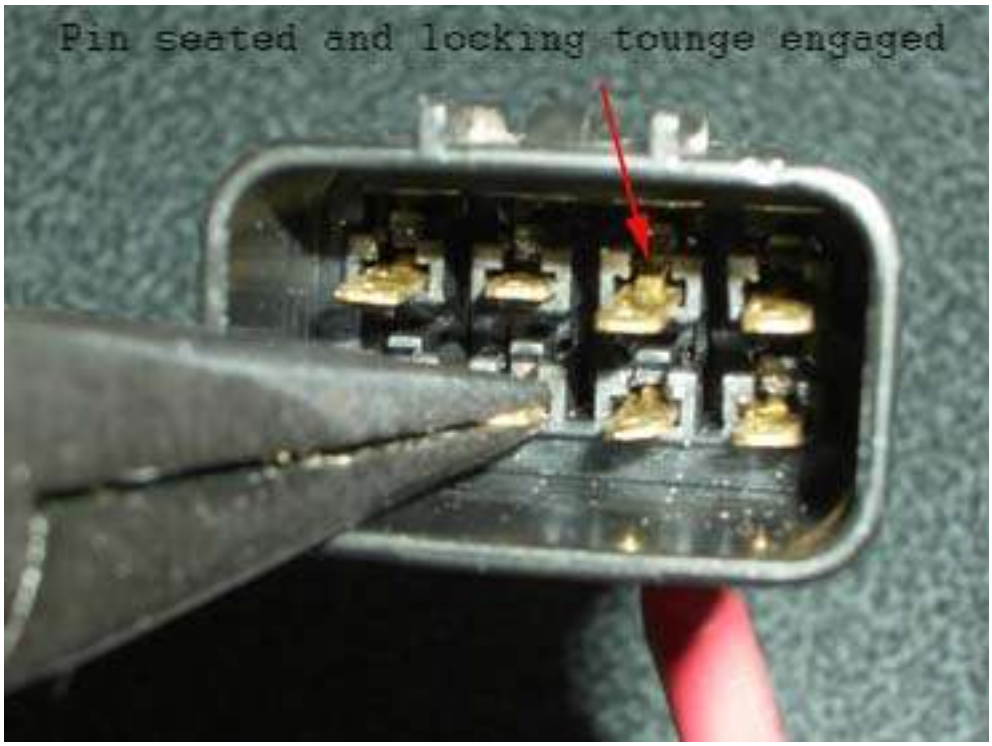
Remove all but one of the yellow water seals (plugs) from the housing. They can easily be pulled or pushed out from other side.

Now carefully insert the blade pins into the housing (where the yellow plugs used to be) and push ‘em in as far as you can for now.

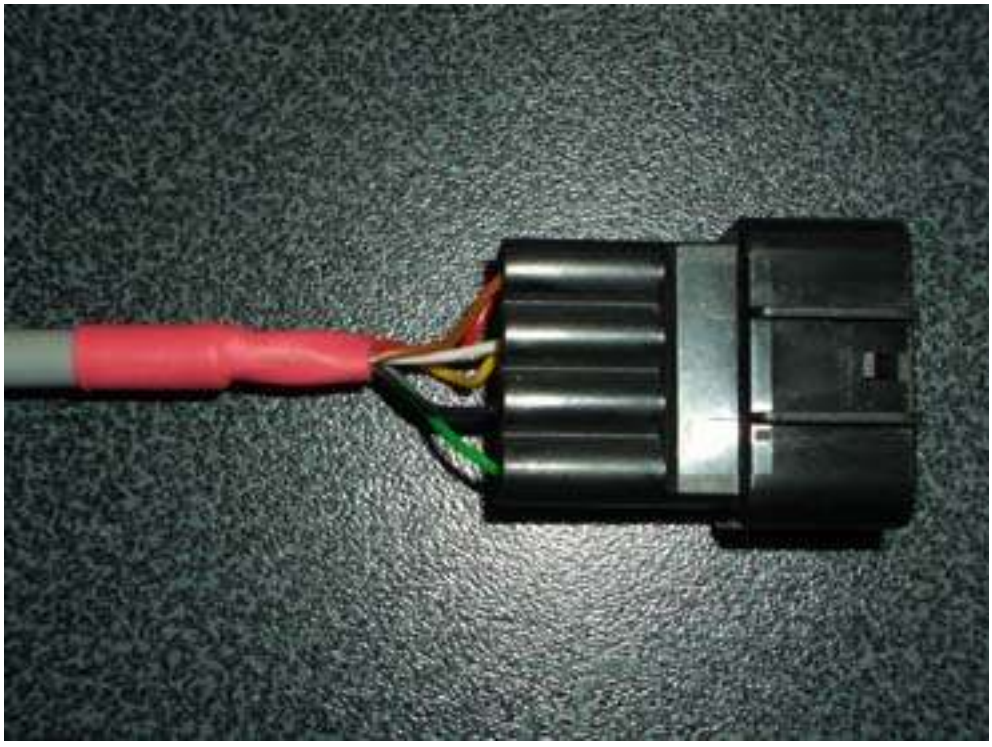


… like this.

Make sure the 'locking tongue' on the pins is in the correct position. Now carefully **'work the pins into the 'locked' position**. This needs some effort due to those tiny 'winglets' to the sides of the pins. I found the best way to do this is by using some pointed pliers and pull the pins with a somewhat wiggly motion into the final position. Again, it needs some effort, so take you time, in the end it'll work and the pins are properly seated.



Pull the pins into position.

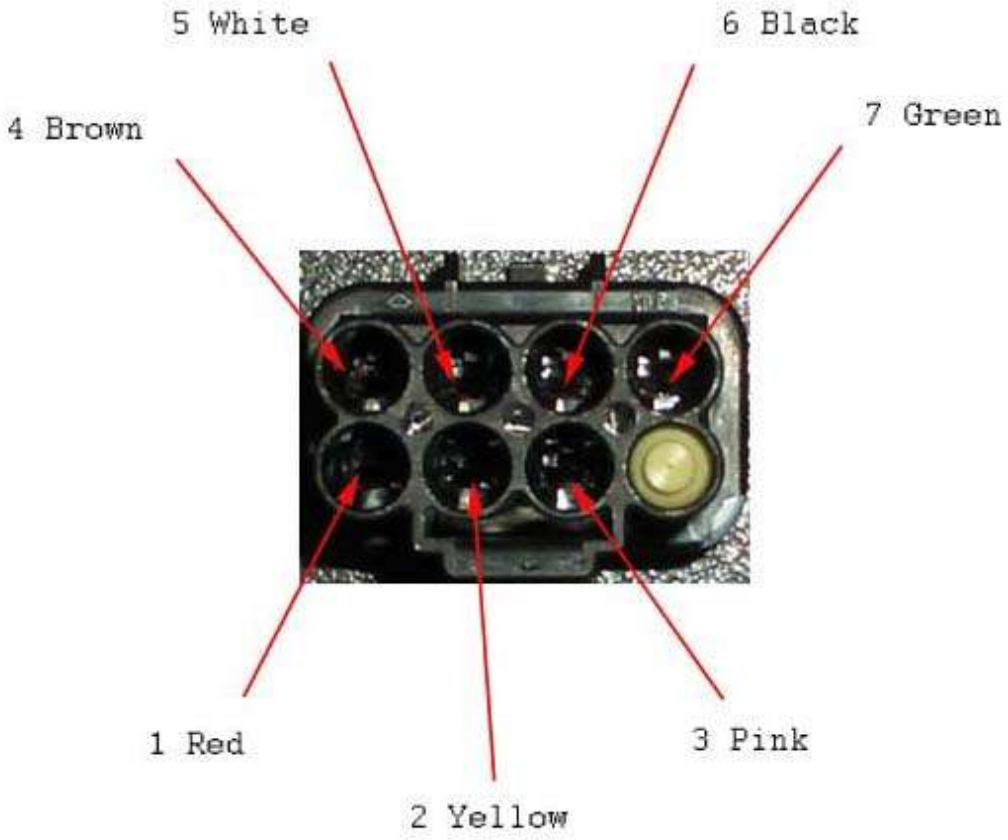


Connector is ready to use.

7. Color matching scheme

The following table shows how the schematic's pin numbers and your bikes wiring harness matches the box's cabling :

Box Schematic	Bike wiring harness	Box Connector
Pin 1	Blue/Red	Red
Pin 2	Blue/Yellow	Yellow
Pin 3	Red	Pink
Pin 4	Black/Brown	Brown
Pin 5	Blue/White	White
Pin 6	Blue/Black	Black
Pin 7	Blue/Green	Green



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Yoshimura Advanced Fuel Management System

Adjuster Box - Instruction Sheet

R-421 Adjuster Box Suzuki GSXR750 1998-9 / TL1000S/R 1997-9 / GSX1300R 1999

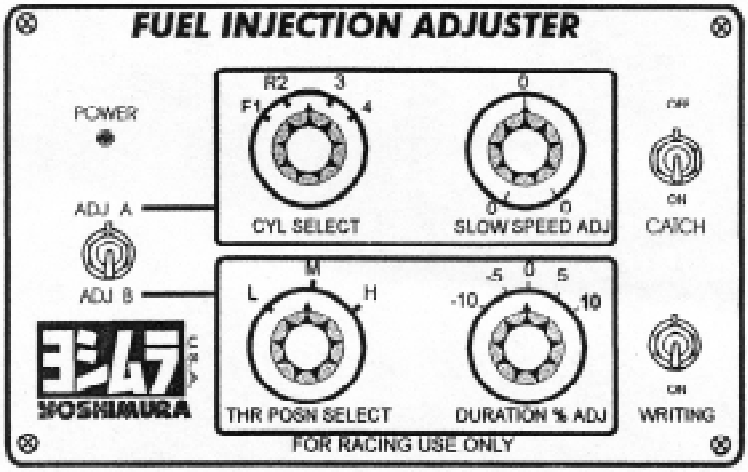
The YAFMS adjuster box adjusts both stages of the Suzuki two-stage fuel injection system. The Adjust-A section affects the idle circuit portion of the fuel injection.
The idling system is in effect during low-load (cruising-idling) situations.
The Adjust-B portion affects the acceleration portion of the fuel injection. The acceleration system is in effect during high-load (acceleration) situations. The idle stage selects fuel maps based mainly on the motorcycle's various sensor inputs while the acceleration stage selects maps based on throttle position and RPM. This translates to the Adjust-A portion of the adjuster affecting slow-speed adjustments and the Adjust-B portion adjusts the higher RPM range.

The first step when making adjustments is to connect the adjuster box cable to the seven-pin male connector on the OEM harness. You will have to remove the waterproof cap on the coupler before connecting the cable. The coupler is located on the wire harness next to the electronic control module, under the rider seat on the left-hand side of the motorcycle. When finished tuning, be sure to replace the waterproof cap on the OEM male coupler!

Always confirm the ignition switch is ***OFF*** on the motorcycle and that the ***CATCH*** toggle switch located at the upper right of the adjuster box is in the ***OFF*** position prior to connecting the cable or damage may result to the adjuster box.

Once the connection is made, select the fuel curve (idle or acceleration) you want to adjust using the Adjust A/B toggle switch located on the left side of the adjuster box.

Yoshimura recommends that all tuning/testing be done on a load-step dynamometer with an exhaust gas analyzer. Please keep a logbook of adjustments made to the motorcycle(s) fuel injection so changes can be monitored and the bike can be tuned in the most efficient manner.



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Acceleration Map Adjustment Procedure

To increase the fuel injector duration (richen) ***ONLY***, all cylinders simultaneously at the high rpm, full throttle portion of the acceleration map follow the steps below.

1. Make sure the ***CATCH*** toggle switch is in the ***OFF*** position.
2. Attach the communication cable from the adjuster box to the diagnostic tool connector next to the electronic control module under the seat. Shift the bike into neutral.
3. Move the Adjust A/B toggle switch down to the ***ADJ. B*** position.
4. Select ***H*** (high throttle position) on the ***THROTTLE POSITION SELECT*** switch.
5. Select ***5*** or ***10*** (five or ten percent increased injector duration from the standard map) on the ***DURATION % ADJ.*** switch.
6. Turn the ignition key to the ***ON*** position. ***DO NOT START THE MOTORCYCLE!*** You should hear the fuel pump for a few seconds. Once the fuel pump stops, check to see that the YAFMS power light is ***ON.*** If the light is not ***ON*** check the connection and make sure the ignition switch is in the ***ON*** position. When the power light is ***ON*** proceed to the next step.
7. Move the ***CATCH*** toggle switch down to the ***ON*** position.
8. Move the ***WRITING*** momentary switch down and hold it down for 4 seconds.
9. Release the ***WRITING*** momentary switch.
10. Once all tuning is completed for the Adjust B fuel curve, move the ***CATCH*** switch up to the ***OFF*** position. All changes are saved to the electronic control module after the ***CATCH*** switch is moved up to the ***OFF*** position.
11. Wait for 2 seconds then turn the ignition key to the ***OFF*** position.
12. Disconnect the adjuster box from the motorcycle wire harness when finished tuning. Never leave the adjuster box connected when starting or riding the motorcycle.

To adjust the injector duration for ¼ and ½ throttle positions, during step 4 select ***L*** for ¼ throttle and ***M*** for ½ throttle. To return to stock fuel injection settings, select ***0*** during step 5 for all throttle positions. To reduce fuel injector duration, select ***-5*** or ***-10*** during step 5 for the desired throttle position at step 4. Remember that changing the ***ADJ. B*** portion affects all cylinders at the same time. To return to stock settings, set the adjustment to ***0*** and program the box per the above instructions. The bike will now be at the original factory settings.

Recommended Starting Point for Acceleration Circuits:

	Slip-on	Full Exhaust	Full Exhaust/Air filter
GSXR750W 1998-1999:	+5L, +5M, 0H	+5L, +5M, 0H	+5L, +10M, +5H
TL1000S 1997-1999:	+5L, 0M, 0H	+5L, +5M, 0H	+5L, +5M, +5H
TL1000R 1998-1999:	+5L, 0M, 0H	+5L, +5M, +5H	+5L, +10M, +5H
GSX1300R 1999:	+5L, +5M, 0H	+5L, +5M, +5H	+5L, +5M, +5H

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Idle Map Adjustment Procedure

The slow speed adjustments are made to each cylinder and please note that the adjuster knob is very sensitive. This knob affects the percent CO (carbon monoxide) emitted by the engine. CO% is an easy way to tell richness or leanness. A reasonable range is 2-3% CO for optimum mixture. Very slight movements counter-clockwise of the top center ***0*** on the ***SLOW SPEED ADJ.*** knob richen and slight movements to the right lean the idle mixture. A practical range for proper mixture will be found +/- 90º from the 12 o'clock position. Note that maximum richness or leanness correction occurs at the halfway point between the 12 o'clock position and the left or right ***0*** positions. Each motorcycle reacts differently to adjustments made with the ***SLOW SPEED ADJ.*** knob and requires fine-tuning similar to a pilot mixture screw on a carburetor.

To richen the slow speed-stage of the number one cylinder only on a 1999 GSXR750 follow the steps below.

1. Make sure the ***CATCH*** toggle switch is in the ***OFF*** position.
2. Attach the communication cable from the adjuster box to the diagnostic tool connector next to the electronic control module under the seat. Shift the bike to neutral.
3. Move the Adjust A/B toggle switch up to the ***ADJ. A*** position.
4. Select ***F1*** (cylinder #1) on the ***CYL. SELECT*** switch.
5. Position the ***SLOW SPEED ADJ.*** knob to the median position (at the 12 o'clock ***0*** position). Turn the ***SLOW SPEED ADJ.*** knob counter-clockwise to richen the idle mixture. This is a sensitive adjustment - a 10º move to the left is a good starting point.
6. Turn the Ignition key to the ***ON*** position. ***DO NOT START THE MOTORCYCLE!*** You should hear the fuel pump for a few seconds. Once the fuel pump stops, confirm that the YAFMS power light is ***ON***. If the light is not ***ON*** check the connection and make sure the ignition switch is at the ***ON*** position. When the YAFMS power light is confirmed to be ***ON***, proceed to the next step.
7. Move the ***CATCH*** toggle switch down to the ***ON*** position.
8. Move the ***WRITING*** momentary switch down and hold it down for 4 seconds.
9. Release the ***WRITING*** momentary switch.
10. Move the ***CATCH*** switch up to the ***OFF*** position. The change is saved to the electronic control module after the ***CATCH*** switch is moved up to the ***OFF*** position.
11. Wait for 2 seconds then turn the ignition key to the ***OFF*** position.
12. Remove the adjuster box from the motorcycle when finished tuning. Never leave the adjuster box connected when starting or riding the motorcycle.

For the remaining cylinders repeat the above steps, but at step 4 select ***R2*** (cylinder #2), ***3*** (cylinder #3) and ***4*** (cylinder #4). To adjust the slow speed stage of the TL1000S/R '97-98, follow the above steps and at step 4 select ***F1*** for the front cylinder and ***R2*** for the rear cylinder. Remember that the idle-speed adjustments are made to each individual cylinder and not tuning every cylinder may result in a rough idle and/or poor off-idle acceleration. To return to stock settings, set the adjustment to the 12 o'clock ***0*** and program the box per instructions. The bike will now be at the original factory settings.

Important Note: If the motorcycle is equipped with exhaust air-injection, a qualified mechanic must block-off this device at the exhaust port or it will result in a small back-fire when closing the throttle from full open. This modification is not legal for use on public roadways.

Recommended starting point for all applications: 25-30 degrees counter clockwise from the vertical (stock) position.