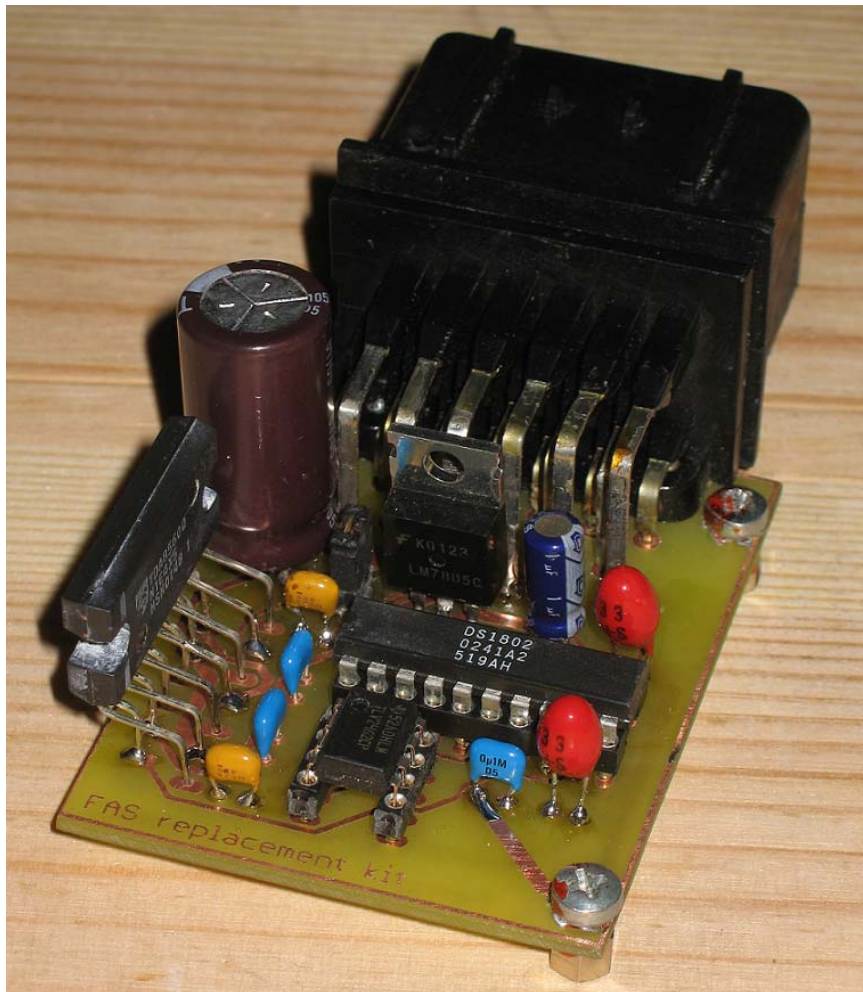


# Fun Audio System Amplifier replacement kit Building instructions Version 3.00RC1



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## About this kit

BMW original Fun Audio System Amplifier is known to have the following issues:

Poor audio quality and limited output power

Automatic volume control not working consistently.

Disabling Automatic volume control result in a power loss of 40%.

This kit was designed to replace original FAS amp circuit by providing:

Same functionalities except automatic volume control and gain adjustment led

Require no modification to existing FAS installation and parts (except amplifier)

Overall power increased from 2x18w to 2x40w (+14dB gain)

High quality components and parts

Simple design to allow a fast production (+/- 1,5 hours are required)

Optional power switch connector to avoid 'flat battery syndrome' by not switching off the ign switch properly

## Disclaimer

These instructions are intended for people having basic electronic skills and able to drill, solder and use a multimeter.

By reading these instructions, you agree to build and use this kit at your own risk, even if some mistakes may occur in this documents or PCB design. In other words, the author is not responsible for any injury or damage caused by you in building or using this kit.

## Required tools or parts

Ohmmeter / DC voltmeter

Wire cutter

Wire stripper

Screwdrivers and pliers

Soldering iron with a sharp and long soldering tip

Solder core

Desoldering wick or desoldering vacuum pump

Thermal grease

Mini driller equipped if possible with a workstation

## Required skills


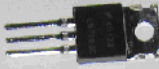
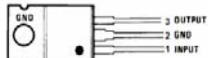

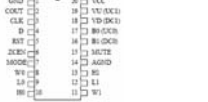

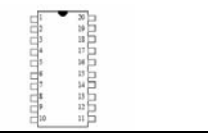

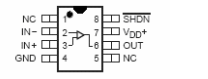

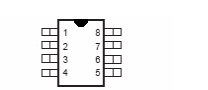

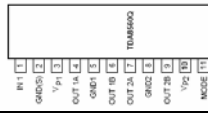






Mount and dismount FAS AMP unit from your C1.

Drilling.

Solder and desolder component using a soldering iron.

Ability to do continuity tests using a multimeter.

## Kit parts list

Qty	Part	Desc
1		FAS replacement Double-Sided and Drilled Printed Circuit Board (PCB)
1	 	7805 IC
1	 	DS1802 IC
1	 	DIP 20 IC support (to be used with DS1802 IC)
1	 	TLV2462 IC
1	 	DIP 8 IC support (to be used with TLV2462 IC)
1	 	TDA8560Q IC
3		100nf unpolarized capacitor (blue ref. 104 or 0.1uF, color may change)
2		470nf unpolarized capacitor (orange ref. 474, color may change)
2		33uF unpolarized capacitor (red ref. 33S+, color may change)
1		1000uF polarized capacitor (medium)
1		2200uF big polarized capacitor (big)
1		Jumper switch

## Building instructions

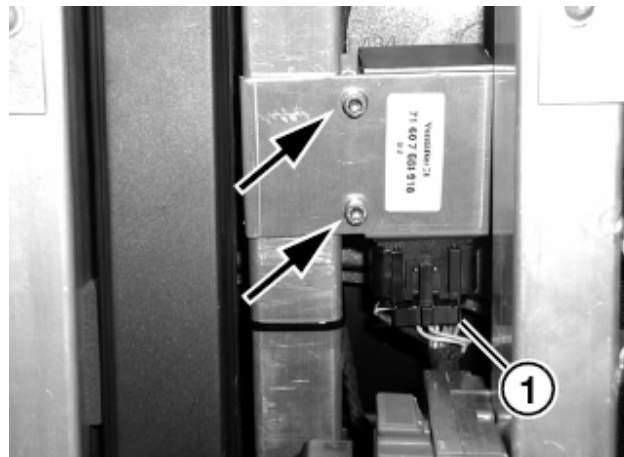
### ***Dismounting existing FAS amp from C1***

Leave C1 steering lock on.

Remove backrest seat

Mark installed position

Remove fasteners (arrows)



Slide amplifier to the left behind the vehicle frame and then extract forward to remove  
Disconnect plug (1)

### ***Recycle FAS box and plug***

Remove screws at the bottom of the box (to be put aside)  
Remove bolts from left side of the box and extract nuts (to be put aside)  
Remove FAS PCB from the box by sliding it to the right.  
Remove all screws from the PCB and from each side of the plug (to be put aside)

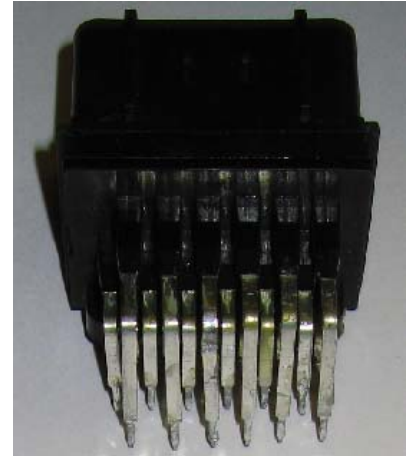
#### **Option 1:**

Remove solder from plug pins on back of PCB. I suggest to use a desoldering vacuum pump or desoldering wick to remove the solder from the pins of the connector before attempting to remove it.

**\*\*\* Be careful and avoid overheating \*\*\***

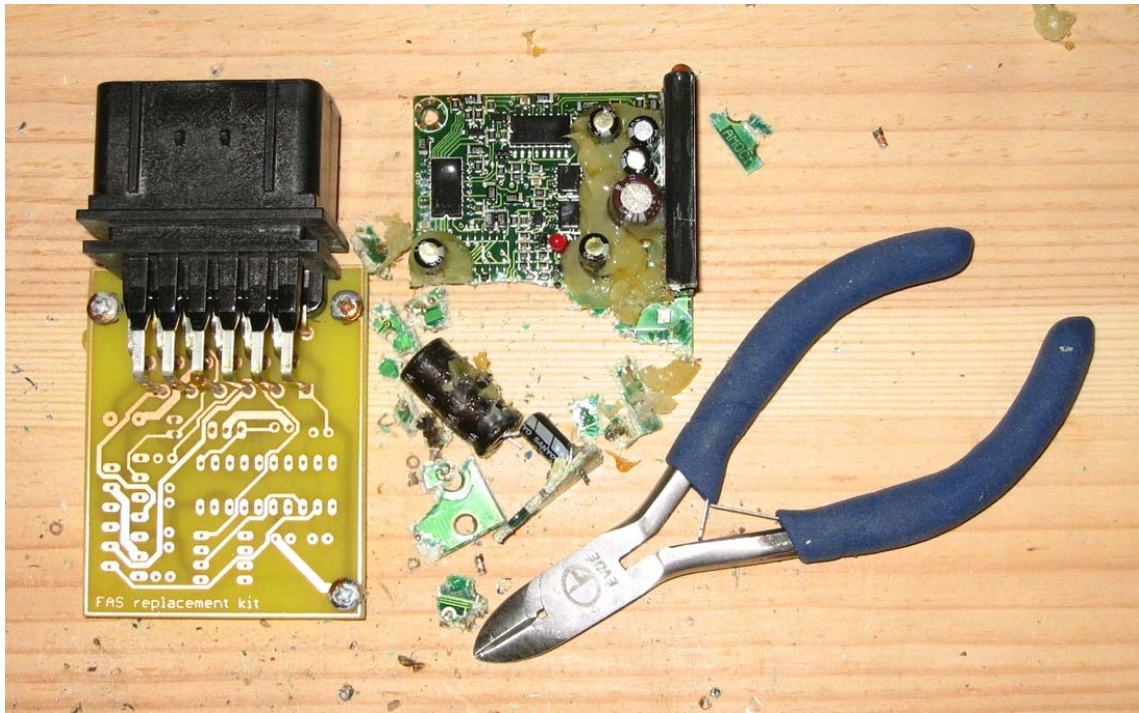
Gently remove the plug by heating its pins on each side and pulling plug alternatively back/forth and left and right. This operation can take time so keep cool and have a break if needed...

Once plug is extracted from PCB, remove remaining solder on its pins and straighten them out with pliers if needed.



#### **Option 2:**

You may also use cutting pliers to recycle the plug (mind its pins), this is an easier job leaving the original PCB permanently destroyed, but who cares? :)  
Once done desolder remaining bits separately.



### ***Passive components mounting***

**IMPORTANT:** Electronic parts soldering **should be done on both sides of PCB**, except for pads with no routing (see Addendum 2). If unsure, solder all pads on both sides.

**Install screws onto PCB (mandatory for ground routing and plug alignment).**

Mount recycled FAS plug onto PCB, check correct depth and alignment by sliding PCB into alu box and if correct solder it. Install screws on each side of the plug.

Mount and solder the following parts:

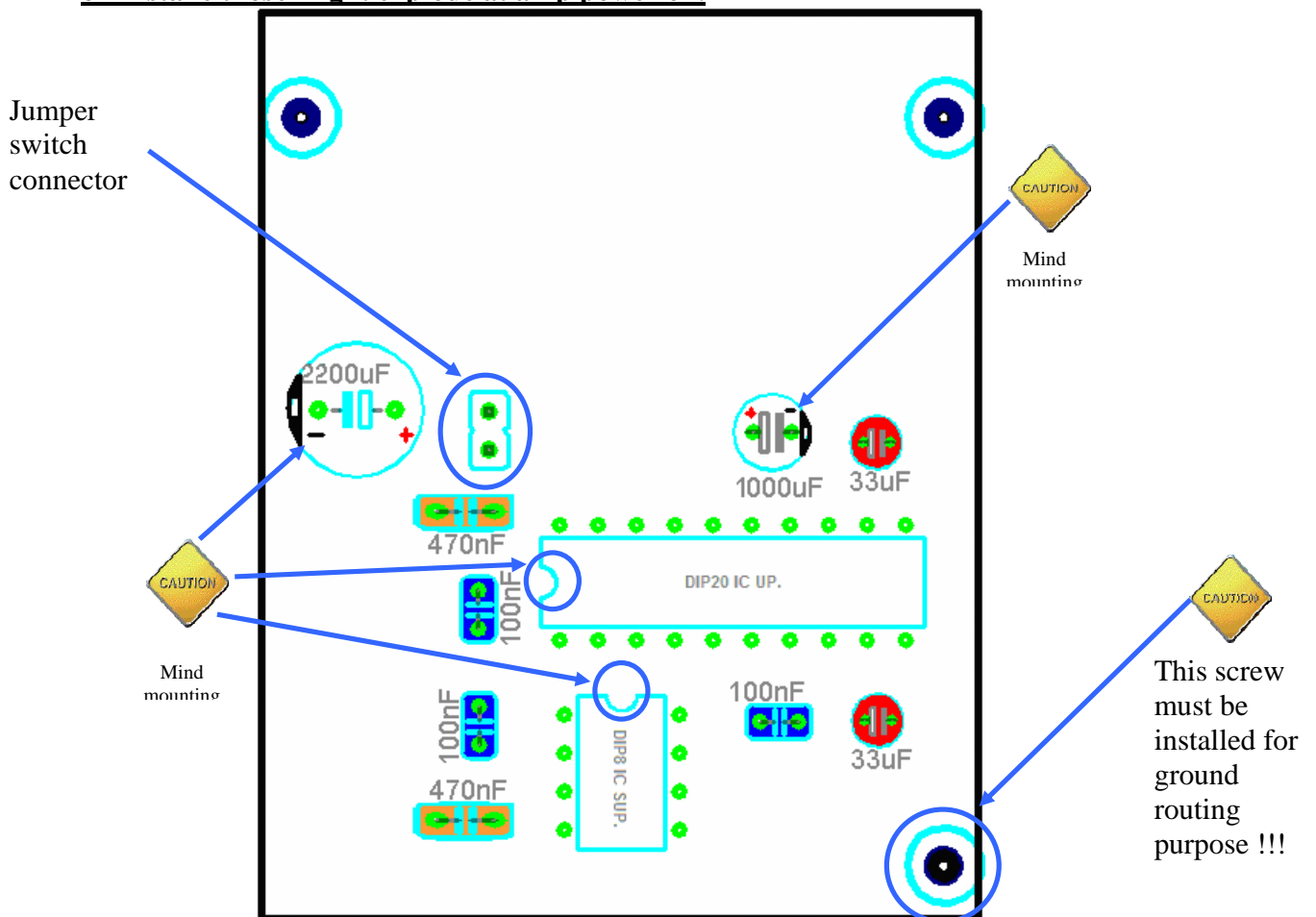
Jumper switch (this is an optional power switch connector so leave it closed!)

DIP 20 IC support (mind its mounting orientation)

DIP 8 IC support (mind its mounting orientation)

Small capacitors (blue, orange and ref) in respect of their values on the schema below.

Mount 1000uF and 2200uF polarized capacitors, check for negative side of the capacitor (white strap with black minus signs) according to the schema below. **Be warned! In case of mistake those might explode at amp power on.**



**Testing – 1**

Using picture below, do continuity test on back of PCB :

Current should pass between those pin pairs:

11 – 12

9 – 10

11 – GND (bolt)

Current should not pass between those pin pairs:

14 – 15

17 – 11

5 – 6

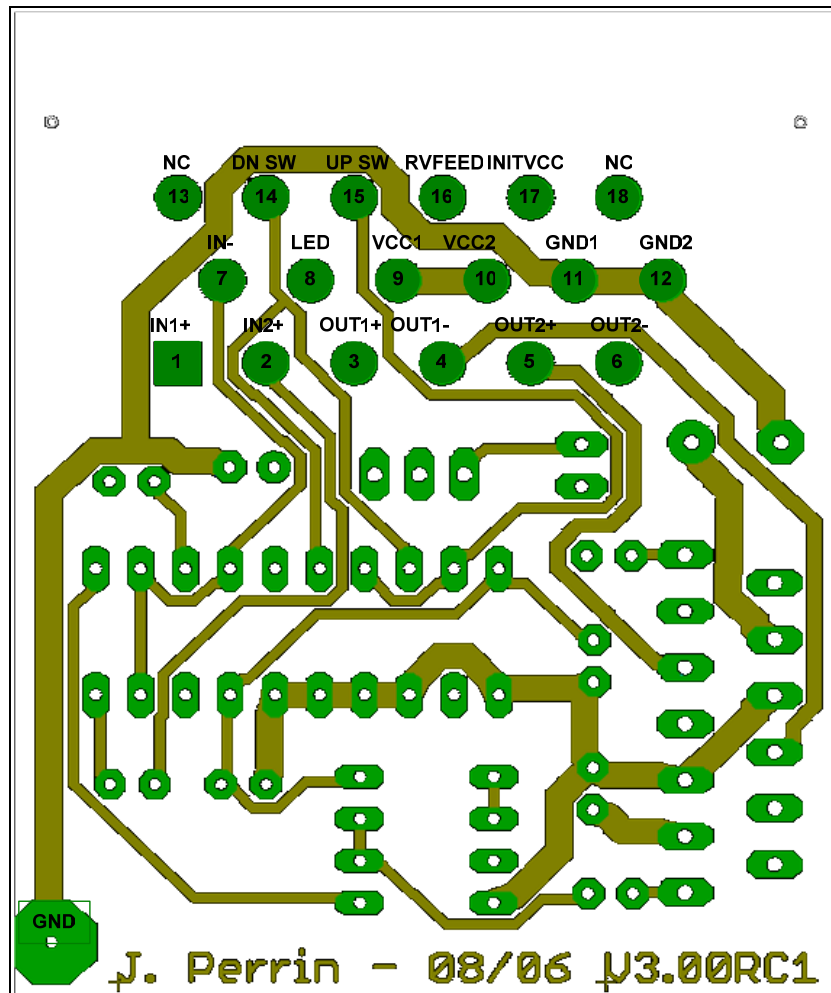
3 – 4

3 – 5

1 – 2

1 – 7

2 – 7





### ***Active components mounting***

Mount and solder the following components:

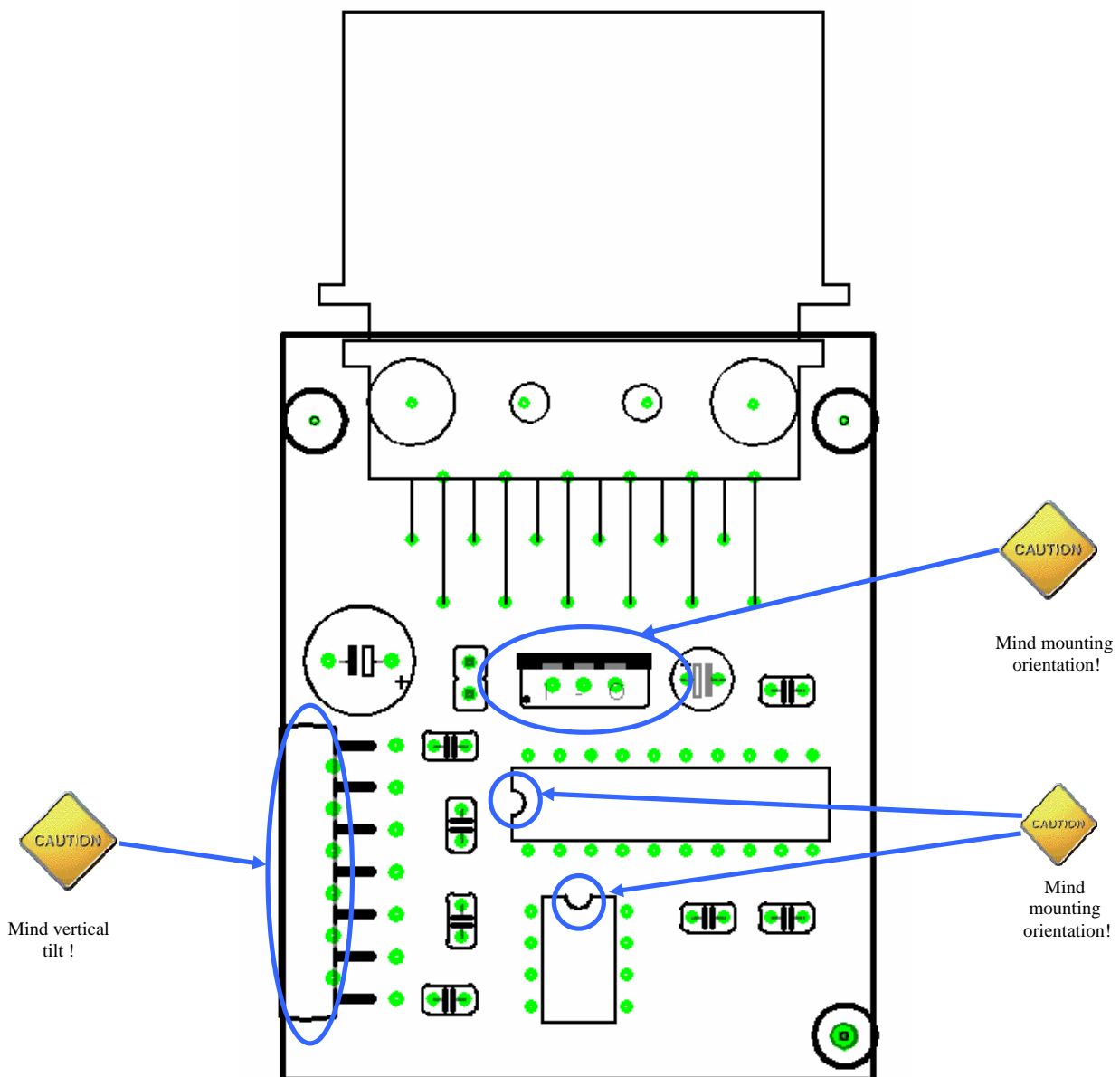
7805 IC (mind its mounting orientation, see the picture below or addendums)

TDA8560Q IC (mind its vertical tilt so its iron plate will perfectly fit on alu box to allow a good heat transfer).

Cut off pins longer than 1mm on copper side of PCB.

Check once again components mounting and orientation. Check PCB copper side for poor soldering or short circuit due to solder bridges.

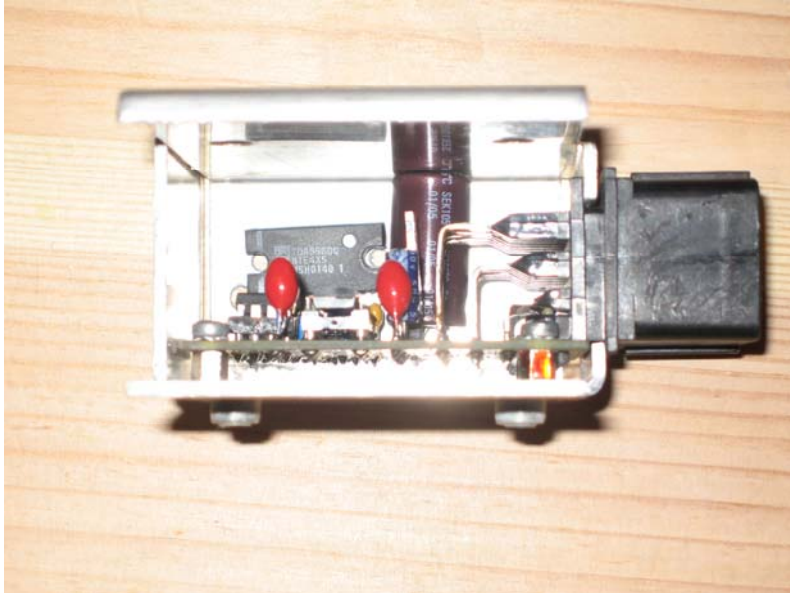
Insert DS1802 and TLV2462 IC into their support with respect to their orientation (see the picture below).



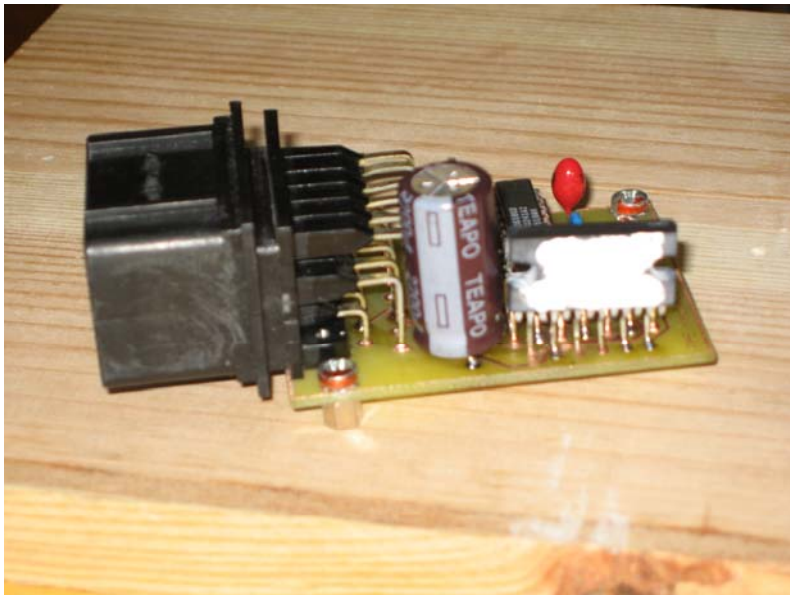
## Putting back PCB into alu box

This step is basically a reversal of the FAS box recycle process after drilling two holes to fasten TDA8560Q onto it.

Slide PCB into alu box. Mark holes for TDA8560Q (see picture below), remove PCB and drill holes (3mm bit).



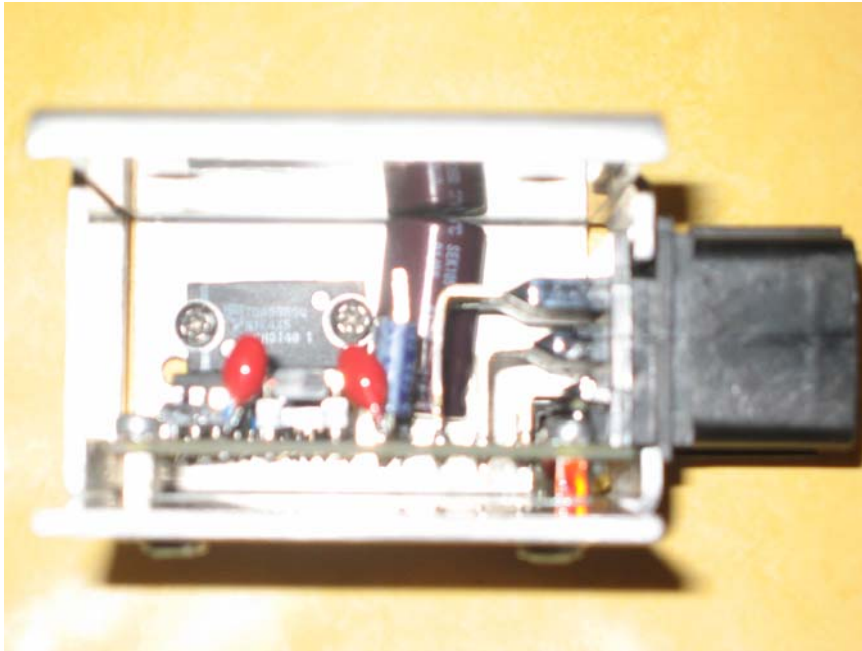
Put a generous amount of thermal paste onto TDA8560Q iron plate and put back PCB into alu box.



**Very important:** TDA8560Q iron plate should be in tight contact with alu box.

**Optionally:** You may immobilize capacitors with warm glue to make sure they won't be damaged by engine vibrations.

Install bolts onto left side of the box and screw nuts to fasten TDA8560Q into box.



Install remaining 3 screws at the bottom of the box to fasten PCB inside box.

### ***Testing new Amp***

Leave C1 steering lock on.

Remove backrest seat.

Plug back amp into C1, let it hang up to the plug while testing and mind short-circuits!

Plug audio jack into audio source (radio, cd or mp3 player), push play and set volume to 30%.

Unlock steering; you may hear a gentle “pop”, at power on amp is muted by default.

Push up volume button for 7 seconds (max volume)

You should hear your favorite record... :)

Adjust audio source volume to maximize volume in respect with audio quality.

Play a while with volume buttons, test long or short pushes (64 positions).

Leave C1 steering lock on to power off.

### ***Final installation***

Leave C1 steering lock on.

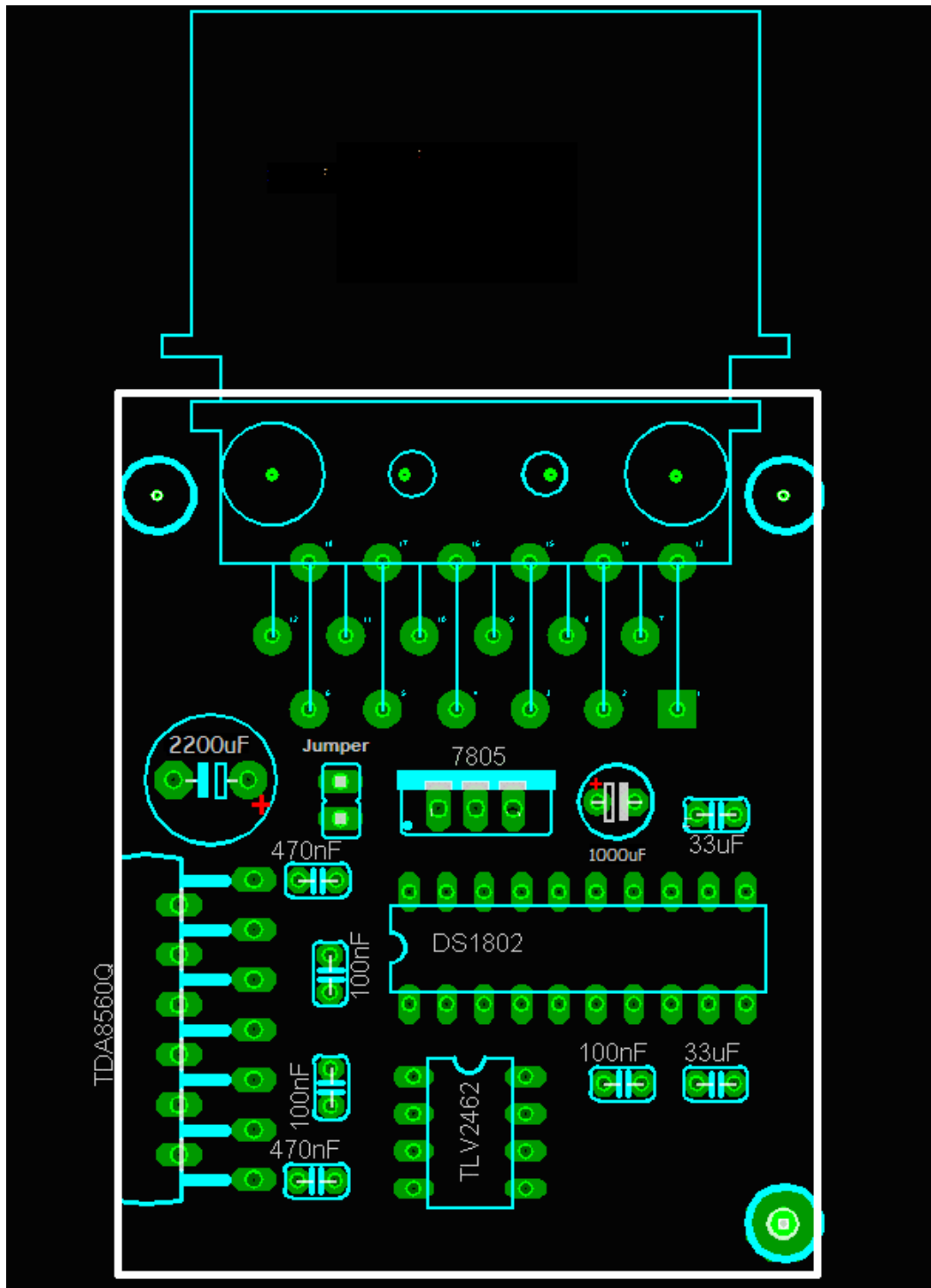
Installation is basically a reversal of the removal process.

Well done you're a proud owner of you own FAS system!

Don't forget to lock steering when parking your C1 to avoid battery drain, to avoid this you can fit an optional switch connected to the jumper onto PCB.

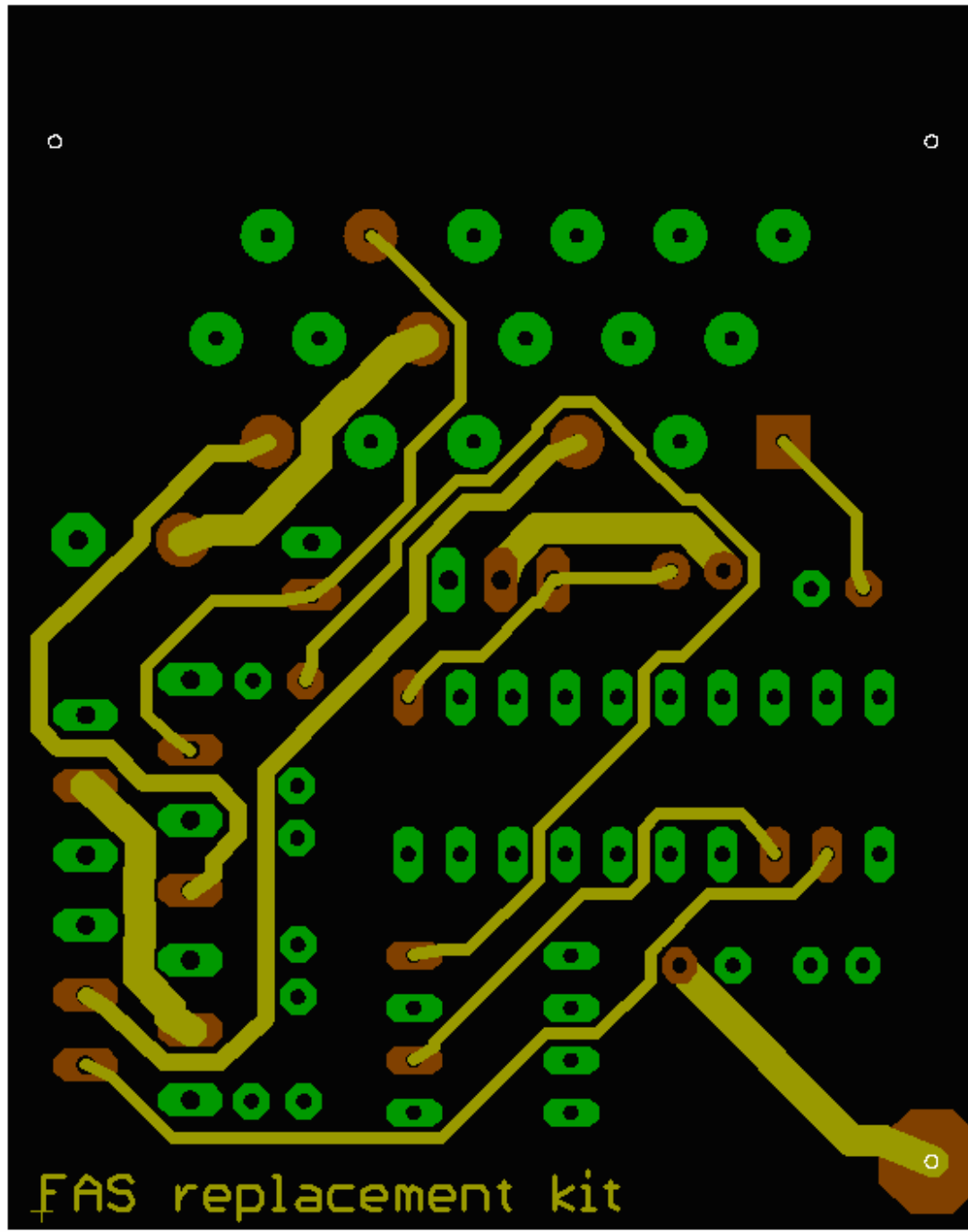
(Send me an email for details - jperrin72@free.fr).

## Addendum 1 – Components mounting

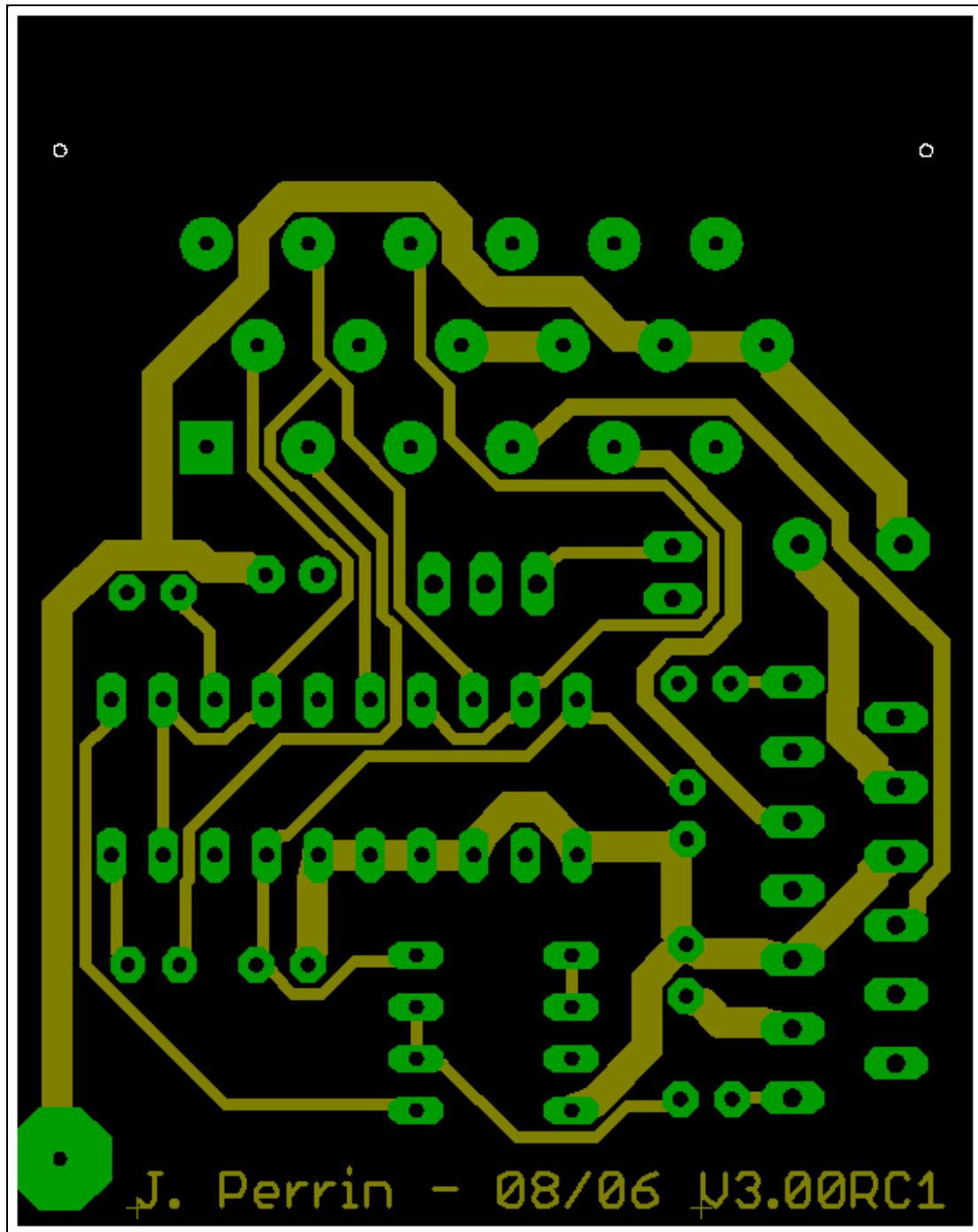


## Addendum 2 – PCB component side

**NB:** Soldering brown pads is mandatory on this side of PCB.

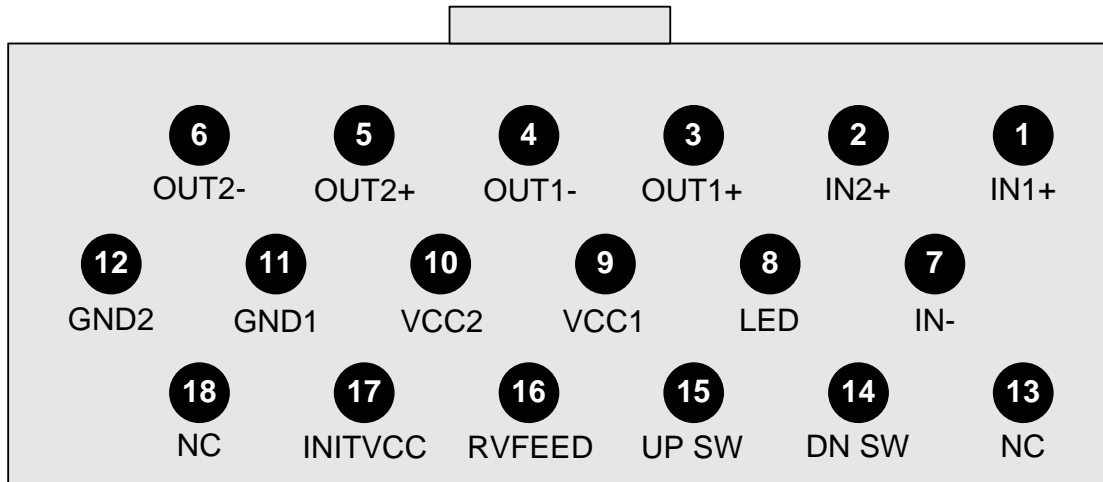


### Addendum 3 – PCB copper side

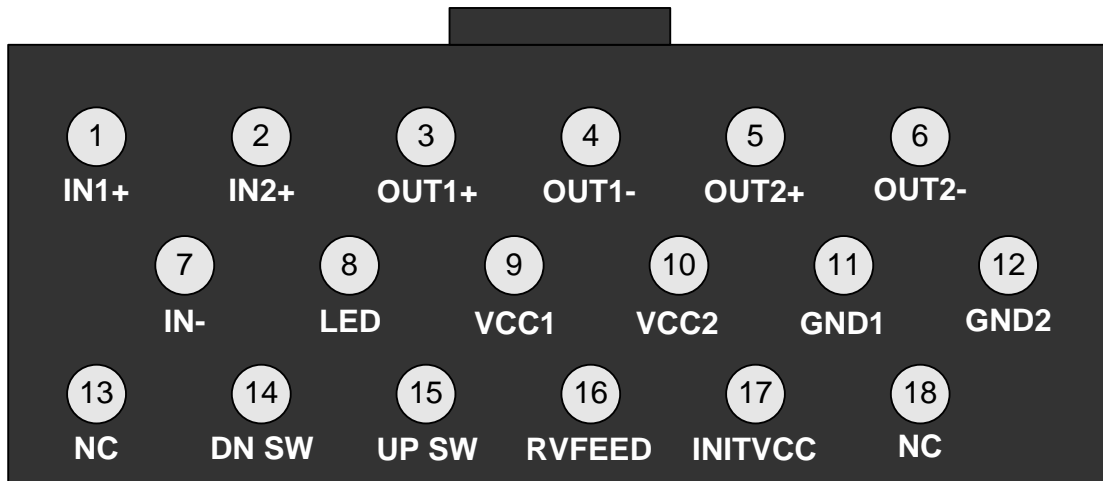


## Addendum 4 – FAS Plug signals

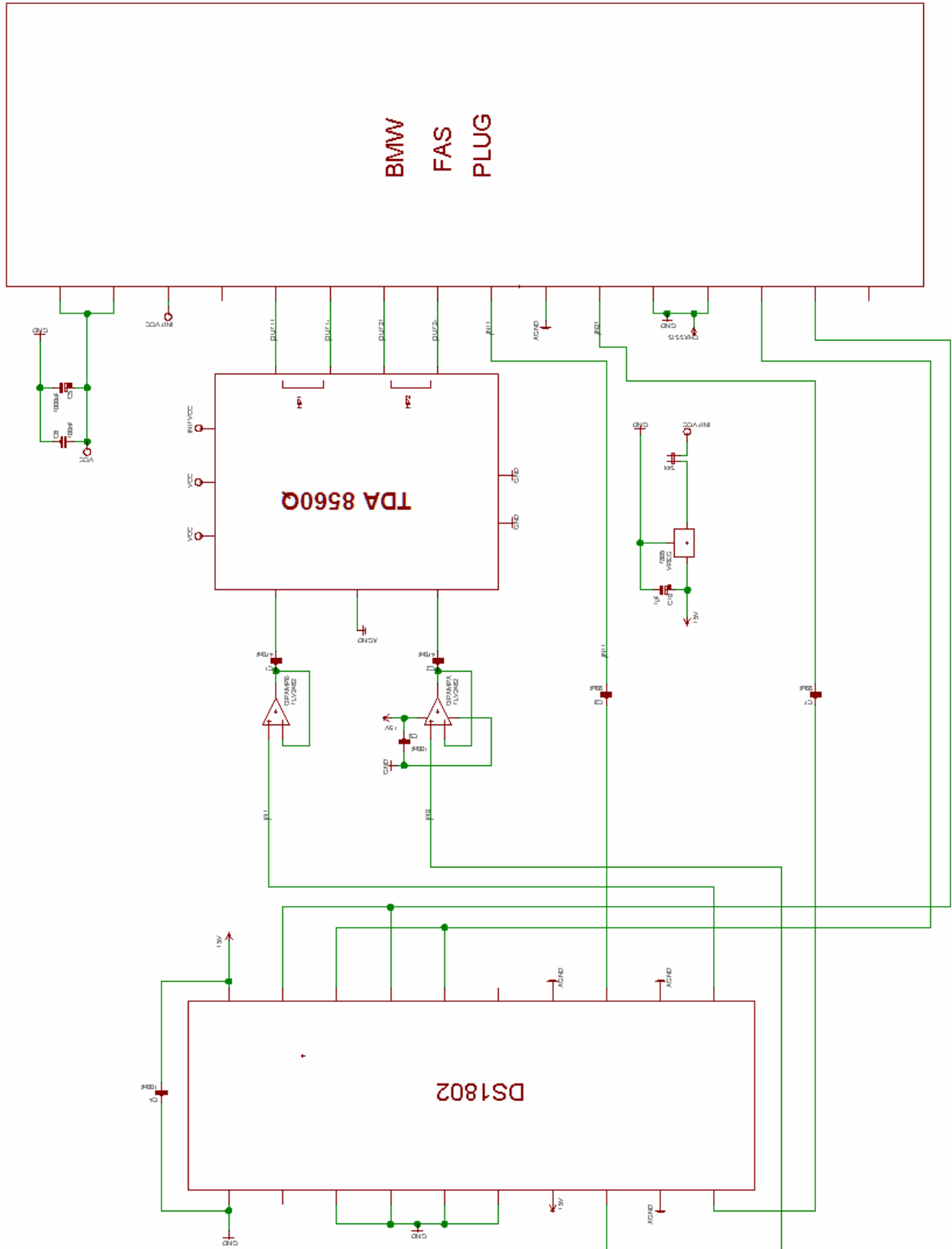
FEMALE PLUG FROM C1 CHASSIS



MALE PLUG FROM FAS AMP



### Addendum 5 – FAS kit schema





## Addendum 6 – FAS replacement kit assembly steps

