

The electrical system is ripe with opportunities for upgrades

LEDs

headlights

advantages -- lower current, less heat in the headlight bucket
caveats -- poor light pattern on some lamps

KatDash: <https://katdash.com/>

turn and brake

Flashing brake/tail 1157 replacement:

<https://tinyurl.com/r6plhyd> eBay 2/\$15 (I have these)

<https://tinyurl.com/vth9ypu> eBay 2/\$10 (no experience)

auxiliary (conspicuity) lighting

<https://tinyurl.com/wyb26u4> (ebay, 2/\$17)

<https://tinyurl.com/v3s3nmx> (amazon 2/\$20)

Typical inexpensive no-pattern running lights:

<https://tinyurl.com/v7a9bgq> (Ebay 2/\$8.50)

Run-n-lites from EPM Performance: <http://www.run-n-lites.com/>

high-output alternator

Enduralast 450W charging system:

<https://www.euromotoelectrics.com/product-p/edl450-altkit.htm>

which has a permanent magnet rotor

Enduralast also has uprated stock-type systems for sale

Motorrad Electric: <http://www.motoelekt.com/charging.htm>

which is an uprated stock-type system

new starter

Valeo's are reliable and more efficient than the old Bosch

buy from Tom Cutter

<http://rubberchickenracinggarage.com/>

Electronic ignition and points boosters

<http://www.dynaonline.com/products/sportbikes/dyna-3.aspx> pts booster

Heated grips

Ebay no-name Chinese: <https://tinyurl.com/vmp47xl> (\$14)

Ebay BikeMaster: <https://tinyurl.com/rgfrls8> (\$50) (I have these)

Ebay Oxford: <https://tinyurl.com/sgshlwx> (\$73) (I also have these)

heated clothing -- battery OR bike powered

LED headlight lamps (H4 replacement)

NovSight: <https://tinyurl.com/rzn3qgt> (Ebay, 2/\$50)

Lithium batteries

EarthX: <https://earthxbatteries.com/product-category/motorcycle>

Shorai: <https://shoraipower.com/batteries-c41>

lighter and smaller for the same total stored energy

less effective in cold weather

may need a special charger to get the best life

How to wire an aux fuseblock

- uses for aux circuit
 - Bigger horn (dual Fiamm's, air horn, etc)
 - <https://www.harborfreight.com/bad-boy-air-horn-94117.html> \$40
 - <https://tinyurl.com/tewerh9> knock-off of above (Ebay, \$13)
 - <https://tinyurl.com/svvn9f5> chrome plated (Ebay, \$26)
 - Aux heated gear circuit
 - Headlight feed for incandescent H4 (discussed later)
- Centech AP-1 (single) or AP-2 (dual circuits)
 - <https://tinyurl.com/u7qcx3w> (AP-1, Ebay, \$57)
 - <https://tinyurl.com/uas5ade> (AP-2, Ebay, \$55)
- other fuse blocks:
 - <https://tinyurl.com/reoq72a> (Ebay, \$15.50, screw terminals, 6 fuses)
 - <https://tinyurl.com/vxurg33> (Ebay, \$8, fast-on, 6 fuses)
- cube relay
 - <https://tinyurl.com/tos68ey> (Ebay, \$5.50 for 2 generic relays)
- location - under the right side cover (difficult on 78-on bikes)
- relay to power aux circuits when key is on
 - relay coil driven from hot to coils
- wire size vs load current
- use DiFfeReNt CoLORed WiRES please!

connecting wires

crimp connectors

insulation colors: red/blue/yellow

Yellow (Bright) #26 - #24

Red #22 - #20, #18

Blue #16 - #14

Yellow (Dull) #12 - #10

solder - proper technique

risk of soldered wire made more brittle near the connection

"lineman's splice", "Western Union" splice, etc. Google it.

https://en.wikipedia.org/wiki/Western_Union_splice

use heat shrink if possible

some heat shrink has hot glue in it.

avoid 3M tap wire things!!! -- the mark of a bodger

slice off insulation, solder on the tap, and then insulate:

good: regular electrical tape

better: self fusing waterproof tape

<https://tinyurl.com/s23by6r> (Ebay, \$2/roll 150cm x 2cm)

best: heatshrink, if you can get one end of the wire free

avoid wire nuts -- the mark of a bodger

avoid electrical tape, the glue fails and the tape falls off

- failure of beryllium copper contacts with repeated heat/cool cycles
 - fuse holders as well as female blade "Faston (tm)" connectors fail
 - this can cause fuse failures in the extreme case
 - aftermarket fuse blocks: Centech AP-1 and AP-2 and others
- improve brightness of headlights
 - voltage drop in wires, connections, and switch or relay contacts
 - headlight voltage drop and addition of relays
 - 95 percent (12.54v) -> 83% light output
 - 90 percent (11.88v) -> 67% light output

85 percent (11.22v) -> 53% light output

- Run a new, heavy line to the headlight circuit, add relays
The Eastern Beaver kit is convenient and well done.
https://www.easternbeaver.com/Main/Wiring_Kits/H4_Kits/h4_kits.html
- replace the entire reflector/bulb assembly with LED
- aged incandescent bulbs have higher resistance, lower light output
but this may result in a poor light pattern that blinds oncoming

replacement for BMW airhead headlight relay

This is a double pole single throw relay with a 12v coil
<https://tinypurl.com/w32kqut> Mouser.com \$3.39 in quantity 1
The Mouser relay is identical to the BMW relay except for
having a plastic case rather than an aluminum case.

Stock BMW headlight relay:

61 32 1 358 193 RELAY \$52.96 superseded by:
61 32 1 358 198 RELAY \$52.96

What is a points booster?

A points booster is an electronic switch, which carries the coil current. The points are retained but the current through them is low and non-inductive, so the points contacts will last nearly forever. The chief wear point for the points becomes the rubbing block.

Unlike a full-on electronic ignition, if the points booster fails, the bike can be "fixed" by just unplugging the booster and hooking the points to the coil. The condenser may have to be re-attached if it was disconnected when the booster was installed.