

AIRHEAD INSTRUMENT LAMP CIRCUIT LOGIC

From Facebook "BMW Airheads" page post 04-19-2018 by Tom Cutter

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We had a discussion on the BMW Airheads Facebook page, about a fellow who wanted to eliminate his gauge cluster and only retain his oil pressure and alternator (GEN) warning lamp functions. The ensuing discussion revealed that a LOT of people do not understand how those lamps function, and this is compounded by poorly-printed and –reproduced wiring diagrams in post-factory third-party repair manuals.

These circuits get Ground to illuminate the indicator:

- Oil pressure
- Neutral
- Brake reservoir fluid level

These circuits get Power to illuminate the bulb:

- High Beam
- Turn signal
- Instrument illumination

The GEN indicator bulb uses Imbalance of Voltage between two sources to illuminate the indicator. Thus, when battery voltage and charging system output match, there is not enough current flow through the bulb filament to illuminate the bulb. If voltage on either side of the circuit drops, the bulb lights up.

The delta, or difference, in voltage determines how much voltage flows through the bulb filament, and thus the brightness of the bulb.

This is why the GEN lamp is the only one on the Airhead dash that can glow brightly, dimly, or not at all, in normal operations.

As Kat and Paul Connell (Creators of KATDASH) have learned, this "feature" of incandescent bulb functionality is useful for transmitting information to the rider, but since LED lamps lack that characteristic dimming capability, they had quite a time working up a circuit of electronical witchcraft to mimic that information feature.

My own personal R100(fakeS) is equipped with a KATDASH LED indicator panel, an ENDURALAST 450-watt solid-rotor alternator, and a MOTOBATT AGM battery. All three work very well, but the GEN lamp function lacks the OEM-characteristic ability to glow dimly as the charging system output rises on startup to match the battery voltage, which dips momentarily after starting until it recovers full charge. Thus, after a cold startup, my GEN LED indicator flashes a stuttering semaphore ON-OFF-ON-OFF

pattern. I only see that weird display when I'm in sight of my own mailbox, and by time I'm 300 yards from home, the GEN LED is dark, my voltmeter needle is sitting at 13.8V happily, and she stays there for the whole ride.

(This is an edited version of the Facebook post that I made at 6:30 AM, while sitting in bed, working from memory/no coffee. Then my dog saw that I was awake, jumped into my lap and put her 50-lb. body between me and my phone...so I stopped writing and pressed enter.)

So be nice if you have comments. It would be hoped to limit comments to JUST technical discussion. My hope is for this short article to become a reference for future Airheads. I'll post a final edited version on my website as a free download in the INFORMATION tab.

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